HEWLETT PACKARD

HP 8751A
Network Analyzer
Maintenance Manual

MANUAL CHANGES

HP 8751A
Network Analyzer

Maintenance Manual

MANUAL IDENTIFICATION

Model Number: HP 8751A
Date Printed: Nov. 1990
Part Number: 08751-90030

This supplement contains information for correcting manual errors and for adapting the manual to newer instruments that contains improvements or modifications not documented in the existing manual.

To use this supplement
1. Make all ERRATA corrections
2. Make all appropriate serial-number-related changes listed below

SERIAL PREFIX OR NUMBER	MAKE MANUAL CHANGES

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▸ New Item

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ERRATA

Page vii, Certification

Change as follows:

Hewlett-Packard Company certifies that this product met its published specifications at the time of shipment from the factory. Hewlett-Packard further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by the Institution's calibration facility, or to the calibration facilities of other International Standards Organization members.

Page vii, Limitation Of Warranty

Change as follows:

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

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▸ ERRATA

Page 2-8, Non-Harmonic Spurious Test

Change the table in Step h in Step 3 as follows:

HP 8751A Center Freq.	Spectrum Analyzer			
	CENTER	SPAN	RBW	Marker
493.7625 MHz	493.7625 MHz	20 kHz	300 Hz	Fundamental (f1)
	(f1) + 225 Hz	400 Hz	10 Hz	Spurious Max.
493.76274125 MHz	493.76274125 MHz	20 kHz	300 Hz	Fundamental (f2)
	(f2) + 550 Hz	1 kHz	10 Hz	Spurious Max.
493.7649125 MHz	493.7649125 MHz	20 kHz	300 Hz	Fundamental (f3)
	(f3) + 5.5 kHz	10 kHz	100 Hz	Spurious Max.
493.786625 MHz	493.786625 MHz	100 kHz	300 Hz	Fundamental (f4)
	(f4) + 55 kHz	100 kHz	100 Hz	Spurious Max.
426 MHz	426 MHz	20 kHz	300 Hz	Fundamental
	424 MHz	20 kHz	300 Hz	Spurious Max.

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Page 2-21, Receiver Noise Level Test

Add the following HP 8751A control setting to Step 2:

Source Power = -50 dBm (MENU), POWER, (-), (5), (0), (x1)

Page 2-26, Residual Response Test

Add the following HP 8751A control setting to Step 2:

Source Power = -50 dBm (MENU), POWER, (-), (5), (0), (x1)

Page 2-28, Input Crosstalk Test

Replace the test procedure with the procedure on pages 3 through 8 of this manual change sheet.

Page 2-33, Input Impedance Test

Replace the test procedure with the procedure on pages 9 through 17 of this manual change sheet.

Page 2-68, Non-Harmonic Spurious Test on Calculation Sheet

Change the formula from **f1 + 205 Hz =** to **f1 + 225 Hz =** for CENTER frequency = 493.7625 MHz.

Page 2-69, Phase Noise Test on Calculation Sheet

Change the formula (Test Result) from **[-a+b]** to **[-a+b-20]** .

Page 2-77, Absolute Amplitude Accuracy Test in Calculation Sheet

Change the Test Result's formula from **[-c-a+b]** to **[+c-a+b]** for each input port.

Page 2-89 and 2-90, CW = 300 MHz and CW = 500 MHz, Power Sweep Linearity Test in Performance Test Record

Change the test record according to the pages 18 and 19 of this manual change sheet.

INPUT CROSSTALK TEST

Tests the signal leakage interference between the HP 8751A's two inputs when one input is driven and the other is terminated.

Specification

Input Crosstalk:	(Same ATT for both input ports)
5 Hz ≤ Freq. < 10 kHz	< -95 dB
10 kHz ≤ Freq. ≤ 500 MHz	< -100 dB

Test Equipment

N(m)-N(m) Cable, 61 cm	HP 11500B
50 Ω Termination	HP 909C Opt. 012, 2 ea.

Procedure

1. *—R into A Crosstalk and R into B Crosstalk—*

   a. Set up the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
Source Power = -26 dBm	[MENU], POWER, [-], [2], [6], [x1]
STOP Freq. = 10 kHz	[STOP], [1], [0], [k/m]
Sweep Type: LOG FREQ	[MENU], SWEEP TYPE MENU, LOG FREQ
Number of Points: 20	[MENU], NUMBER of POINTS, [2], [0], [x1]
IF BW: 2 Hz	[AVG], IF BW, [2], [x1]
Marker: Uncoupled	[MKR], MARKER MODE MENU, MARKER: UNCOUPLED
CH 1: A/R, LOG MAG, AVG: 4, Marker Tracking: MAX	[CH 1], [MEAS], A/R, [FORMAT], LOG MAG, [AVG], AVERAGING FACTOR, [4], [x1], AVERAGING on OFF, [MKR FCTN], MKR SEARCH, TRACKING on OFF, SEARCH: MAX
CH 2: B/R, LOG MAG, AVG: 4. Marker Tracking: Max	[CH 2], [MEAS], B/R, [FORMAT], LOG MAG, [AVG], AVERAGING FACTOR, [4], [x1], AVERAGING on OFF, [MKR FCTN], MKR SEARCH, TRACKING on OFF, SEARCH: MAX
Dual Channel: ON	[DISPLAY], DUAL CHAN on OFF
ATTEN: Input-A = 0 dB	[ATTEN], INPUT-A:0dB
ATTEN: Input-B = 0 dB	[ATTEN], INPUT-B:0dB
ATTEN: Input-R = 0 dB	[ATTEN], INPUT-R:0dB

   b. Connect an N(m)-N(m) Cable between HP 8751A RF OUT and Input-R, and connect a 50 Ω Termination to Input-A and Input-B as shown in Figure 1-1.

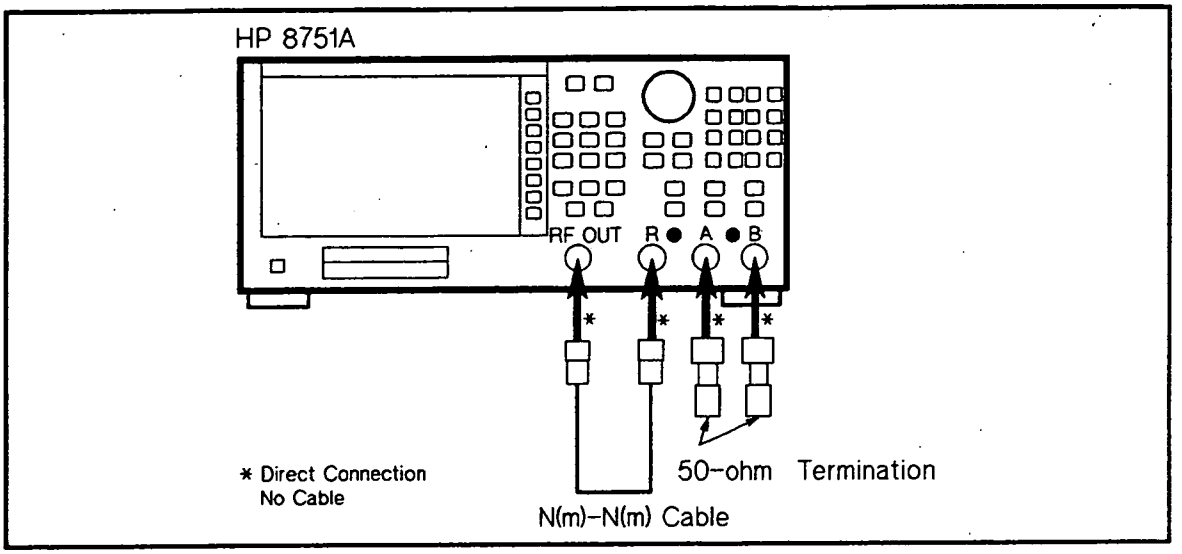

Figure 1-1. Crosstalk Test Setup 1

c. Perform the following key strokes, then wait until the sweeps are completed.

(MENU), TRIGGER MENU, NUMBER of GROUPS, (4), (X1)

d. Record the CH 1 marker value into the *R into A Crosstalk (5 Hz to 10 kHz)* column of the Performance Test Record.

e. Record the CH 2 marker value into the *R into B Crosstalk (5 Hz to 10 kHz)* column of the Performance Test Record.

f. Change the HP 8751A's settings as follows:

Control Settings	**Key Strokes**
START Freq. = 10 kHz	(START), (1), (0), (k/m)
STOP Freq. = 500 MHz	(STOP), (5), (0), (0), (M/u)
Source Power = -20 dBm	(MENU), POWER, (-), (2), (0), (x1)
IF BW: 20 Hz	(AVG), IF BW, (2), (0), (x1)
Number of Points: 201	(MENU), NUMBER of POINTS, (2), (0), (1), (x1)

g. Perform the following key strokes, then wait until the sweeps are completed.

(MENU), TRIGGER MENU, NUMBER of GROUPS, (4), (X1)

h. Record the CH 1 marker value into the *R into A Crosstalk (10 kHz to 500 MHz)* column of the Performance Test Record.

i. Record the CH 2 marker value into the *R into B Crosstalk (10 kHz to 500 MHz)* column of the Performance Test Record.

2. —*A into R Crosstalk and A into B Crosstalk*—

a. Change the HP 8751A's settings as follows:

Control settings	Key Strokes
Source Power = -26 dBm	MENU, POWER, -, 2, 6, x1
START Freq. = 5 Hz	START, 5, Hz
STOP Freq. = 10 kHz	STOP, 1, 0, k/m
CH 1: A, LOG MAG	CH 1, MEAS, A, FORMAT, LOG MAG
CH 2: A, LOG MAG	CH 2, MEAS, A, FORMAT, LOG MAG
IF BW: 2 Hz	AVG, IF BW, 2, x1
Number of Points: 20	MENU, NUMBER of POINTS, 2, 0, x1

b. Connect the equipment as shown in Figure 1-2.

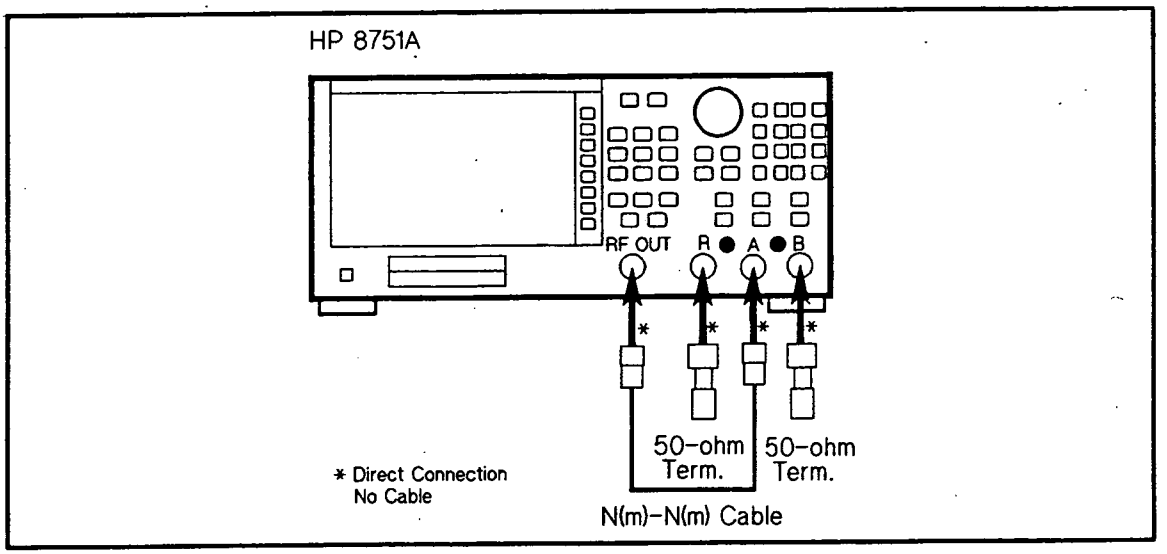

Figure 1-2. Crosstalk Test Setup 2

c. Perform the following key strokes, then wait until the sweeps are completed.

MENU, TRIGGER MENU, NUMBER of GROUPS, 4, X1

d. Perform the following key strokes:

CH 1, DISPLAY, DEFINE TRACE, DATA → MEM, DATA/MEM, CH 2, DATA → MEM, DATA/MEM

e. Change the HP 8751A's settings as follows:

Control settings	Key Strokes
CH 1: R	CH 1, MEAS, R
CH 2: B	CH 2, MEAS, B

f. Perform the following key strokes, then wait until the sweeps are completed.

(MENU), TRIGGER MENU, NUMBER of GROUPS, (4), (X1)

g. Record the CH 1 marker value into the *A into R Crosstalk (5 Hz to 10 kHz)* column of the Performance Test Record.

h. Record the CH 2 marker value into the *A into B Crosstalk (5 Hz to 10 kHz)* column of the Performance Test Record.

i. Change the HP 8751A's settings as follows:

Control Settings	Key Strokes
CH 1: A	(CH 1), (MEAS), A
CH 2: A	(CH 2), (MEAS), A
START Freq. = 10 kHz	(START), (1), (0), (k/m)
STOP Freq. = 500 MHz	(STOP), (5), (0), (0), (M/u)
Source Power = -20 dBm	(MENU), POWER, (-), (2), (0), (x1)
IF BW: 20 Hz	(AVG), IF BW, (2), (0), (x1)
Number of Points: 201	(MENU), NUMBER of POINTS, (2), (0), (1), (x1)

j. Perform the following key strokes, then wait until the sweeps are completed.

(MENU), TRIGGER MENU, NUMBER of GROUPS, (4), (X1)

k. Perform the following key strokes:

(CH 1), (DISPLAY), DEFINE TRACE, DATA → MEM, (CH 2), DATA → MEM

l. Change the HP 8751A's settings as follows:

Control Settings	Key Strokes
CH 1: R	(CH 1), (MEAS), R
CH 2: B	(CH 2), (MEAS), B

m. Perform the following key strokes, then wait until the sweeps are completed.

(MENU), TRIGGER MENU, NUMBER of GROUPS, (4), (x1)

n. Record the CH 1 marker value into the *A into R Crosstalk (10 kHz to 500 MHz)* column of the Performance Test Record.

o. Record the CH 2 marker value into the *A into B Crosstalk (10 kHz to 500 MHz)* column of the Performance Test Record.

3. *—B into R Crosstalk and B into A Crosstalk—*

a. Change the HP 8751A's settings as follows:

Control settings	Key strokes
Source Power = -26 dBm	(MENU), POWER, (-), (2), (6), (x1)
START Freq. = 5 Hz	(START), (5), (Hz)
STOP Freq. = 10 kHz	(STOP), (1), (0), (k/m)
CH 1: B, LOG MAG	(CH 1), (MEAS), B, (FORMAT), LOG MAG
CH 2: A/B, LOG MAG	(CH 2), (MEAS), A/B, (FORMAT), LOG MAG

IF BW: 2 Hz — (AVG), IF BW, (2), (x1)

Number of Points: 20 — (MENU), NUMBER of POINTS, (2), (0), (x1)

b. Connect the equipment as shown in Figure 1-3.

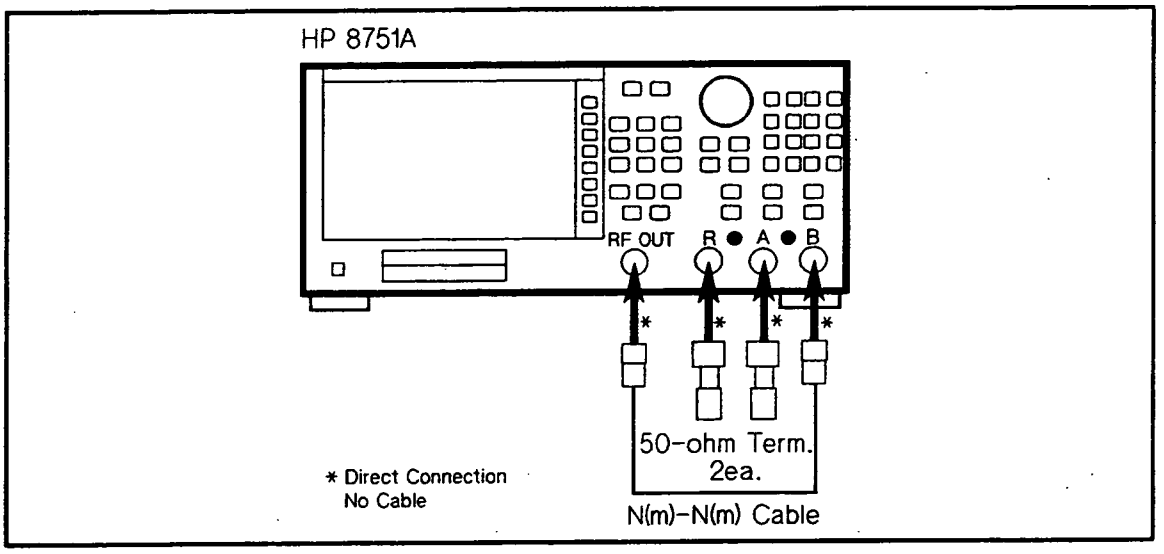

Figure 1-3. Crosstalk Test Setup 3

c. Perform the following key strokes, then wait until the sweeps are completed.

(MENU), TRIGGER MENU, NUMBER of GROUPS, (4), (x1)

d. Perform the following key strokes:

(CH 1), (DISPLAY), DEFINE TRACE, DATA → MEM, (CH 2), DISPLAY: DATA

e. Record the CH 2 marker value into the *B into A Crosstalk (5 Hz to 10 kHz)* column of the Performance Test Record.

f. Change the HP 8751A's settings as follows:

Control settings	**Key Strokes**
CH 1: R	(CH 1), (MEAS), R

g. Perform the following key strokes, then wait until the sweeps are completed.

(MENU), TRIGGER MENU, NUMBER of GROUPS, (4), (x1)

h. Record the CH 1 marker value into the *B into R Crosstalk (5 Hz to 10 kHz)* column of the Performance Test Record.

i. Change the HP 8751A as follows:

Control Settings	**Key strokes**
CH 1: B	(CH 1), (MEAS), B
START Freq. = 10 kHz	(START), (1), (0), (k/m)
STOP Freq. = 500 MHz	(STOP), (5), (0), (0), (M/u)

Source Power = -20 dBm	(MENU), POWER, (-), (2), (0), (x1)
IF BW: 20 Hz	(AVG), IF BW, (2), (0), (x1)
Number of Points: 201	(MENU), NUMBER of POINTS, (2), (0), (1), (x1)

j. Perform the following key strokes, then wait until the sweeps are completed.

(MENU), TRIGGER MENU, NUMBER of GROUPS, (4), (X1)

k. Perform the following key strokes:

(CH 1), (DISPLAY), DEFINE TRACE, DATA → MEM

l. Record the CH 2 marker value into the *B into A Crosstalk (10 kHz to 500 MHz)* column of the Performance Test Record.

m. Change the HP 8751A's setting as follows:

Control settings	**Key Strokes**
CH 1: R	(CH 1), (MEAS), R

n. Perform the following key strokes, then wait until the sweeps are completed.

(MENU), TRIGGER MENU, NUMBER of GROUPS, (4), (x1)

o. Record the CH 1 marker value into the *B into R Crosstalk (10 kHz to 500 MHz)* column of the Performance Test Record.

INPUT IMPEDANCE TEST

Measures the return loss to check the HP 8751A's input impedance.

Specification

Input Impedance: 50 Ω Nominal

Frequency	ATT = 0 dB	ATT = 20 dB
5 Hz ≤ Freq. ≤ 100 MHz	> 20 dB	> 25 dB
100 MHz < Freq. ≤ 300 MHz	> 15 dB	> 25 dB
300 MHz < Freq. ≤ 500 MHz	> 10 dB	> 20 dB

Test Equipment

50 Ω T/R Test Kit	HP 87512A
50 Ω type-N calibration kit	HP 85032B
50 Ω type-N RF cable set	HP 11851B
N(f)-N(f) Adapter	PN 1250-0777, 2 ea.

Procedure

1. *—Input B Impedance Test—*

   a. Connect the equipment as shown in Figure 1-4.

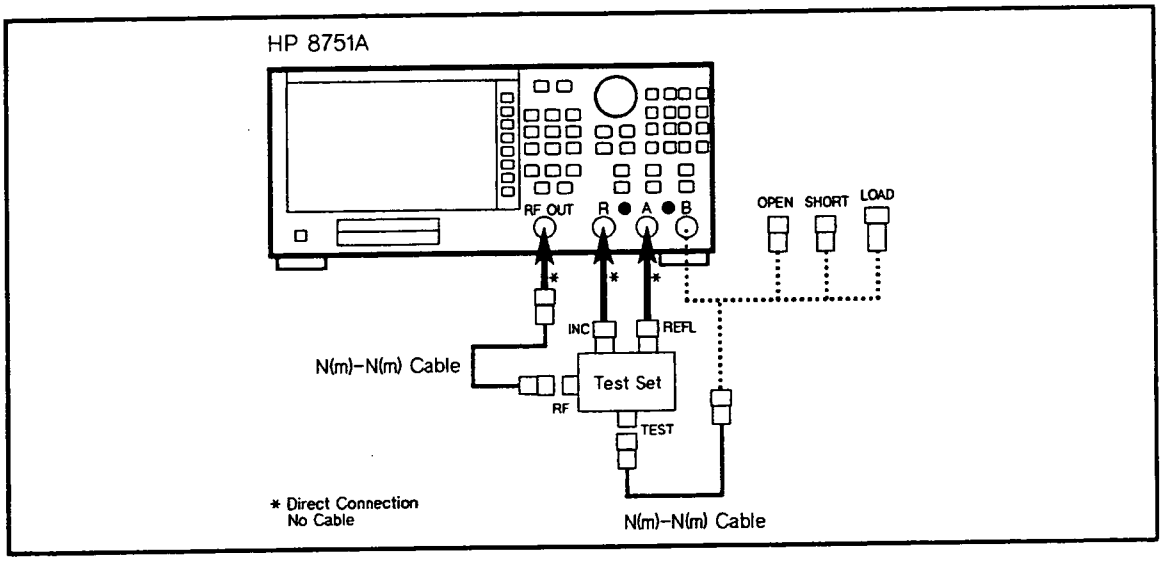

Figure 1-4. Input B Impedance Test Setup

   b. Set up the HP 8751A as follows:

Control Settings	Key strokes
PRESET	(PRESET)
Meas. Config. : A/R	(MEAS), A/R

STOP Freq. = 100 MHz	(STOP), (1), (0), (0), (M/u)
Source Power: -18 dBm	(MENU), POWER, (-), (1), (8), (x1)
NUMBER of POINTS: 26	(MENU), NUMBER of POINTS, (2), (6), (x1)
IF BW: AUTO	(AVG), IF BW, IF BW AUTO
Sweep Type: LOG SWEEP	(MENU), SWEEP TYPE MENU, LOG FREQ
Marker: MKR SEARCH: Tracking ON [MAX]	(MKR FCTN), MKR SEARCH, TRACKING on OFF, MAX

c. Perform the following one port calibration sequence.

i. Press (CAL), CAL KIT, N 50 Ω, RETURN, CALIBRATE MENU, S11 1-PORT

ii. Connect a type-N(f) open to the test port cable and press OPENS, OPEN [M], DONE:OPENS.

iii. Connect a type-N(f) short to the test port cable and press SHORTS, SHORT [M], DONE:SHORTS.

iv. Connect a type-N(f) 50 Ω Termination (LOAD) to the test port cable and press LOAD, DONE 1-PORT CAL.

d. Remove the 50 Ω Termination from the test port cable and connect the cable to the open input port of the analyzer.

e. Perform the following single sweep measurement key strokes.

(MENU), TRIGGER MENU, SINGLE

f. Press (SCALE REF), AUTO SCALE.

g. Change the sign of and record the marker reading value into the *B return Loss (20 dB, 5 Hz to 100 MHz)* test result column into the Performance Test Record.

h. Press (ATTEN) and INPUT-B: 0 dB.

i. Perform the following single sweep measurement key strokes.

(MENU), TRIGGER MENU, SINGLE

j. Press (SCALE REF), AUTO SCALE.

k. Change the sign of and record the marker reading value into the *B return Loss (0 dB, 5 Hz to 100 MHz)* test result column into the Performance Test Record.

l. Remove the cable from the INPUT-B Connector on the HP 8751A front panel.

m. Change the HP 8751A Control Settings as follows:

Control Settings	**Key Strokes**
START Freq. = 100 MHz	(START), (1), (0), (0), (M/u)
STOP Freq. = 500 MHz	(STOP), (5), (0), (0), (M/u)
IF BW: 200 Hz	(AVG), IF BW, (2), (0), (0), (x1)

n. Perform the following one port calibration sequence.

i. Press (CAL), CALIBRATE MENU, S11 1-PORT

ii. Connect a type-N(f) open to the test port cable and press OPENS, OPEN [M], DONE:OPENS.

iii. Connect a type-N(f) short to the test port cable and press SHORTS, SHORT [M], DONE:SHORTS.

iv. Connect a type-N(f) 50 Ω Termination (LOAD) to the test port cable and press LOAD, DONE 1-PORT CAL.

o. Remove the 50 Ω Termination from the test port cable and connect the cable to the open input port of the analyzer.

p. Perform the following single sweep measurement key strokes.

(MENU), TRIGGER MENU, SINGLE

q. Press (SCALE REF), AUTO SCALE.

r. Set the marker search range from 100 MHz to 300 MHz using the following key strokes.

(MKR), ACTIVATE MARKER, MARKER 1, (1), (0), (0), (M/u), ACTIVATE MARKER, MARKER 2, (3), (0), (0), (M/u), (MKR), Δ MODE MENU, Δ REF MARKER, Δ REF = 1, (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE, PART SRCH on/OFF

s. Move the marker to the maximum value using the following key strokes. Change the sign of, and record the maximum value into the *B Return Loss (0 dB, 100 MHz to 300 MHz)* test result column in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), Δ MODE MENU, Δ MODE OFF

t. Press Δ REF MARKER, Δ REF = 1.

u. Set the marker search range from 300 MHz to 500 MHz using the following key strokes.

(MKR), ACTIVATE MARKER, MARKER 1, (2), (0), (0), (M/u), (MKR), ACTIVATE MARKER, MARKER 2, (2), (0), (0), (M/u), (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE

v. Move the marker to the maximum value using the following key strokes. Change the sign of, and record the maximum value with an opposite sign into the *B Return Loss (0 dB, 300 MHz to 500 MHz)* test result column in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), Δ MODE MENU, Δ MODE OFF

w. Press (ATTEN), INPUT-B: 20 dB.

x. Repeat steps p through v in Step 1.

2. *—Input A Impedance Test—*

a. Connect the equipment as shown in Figure 1-5.

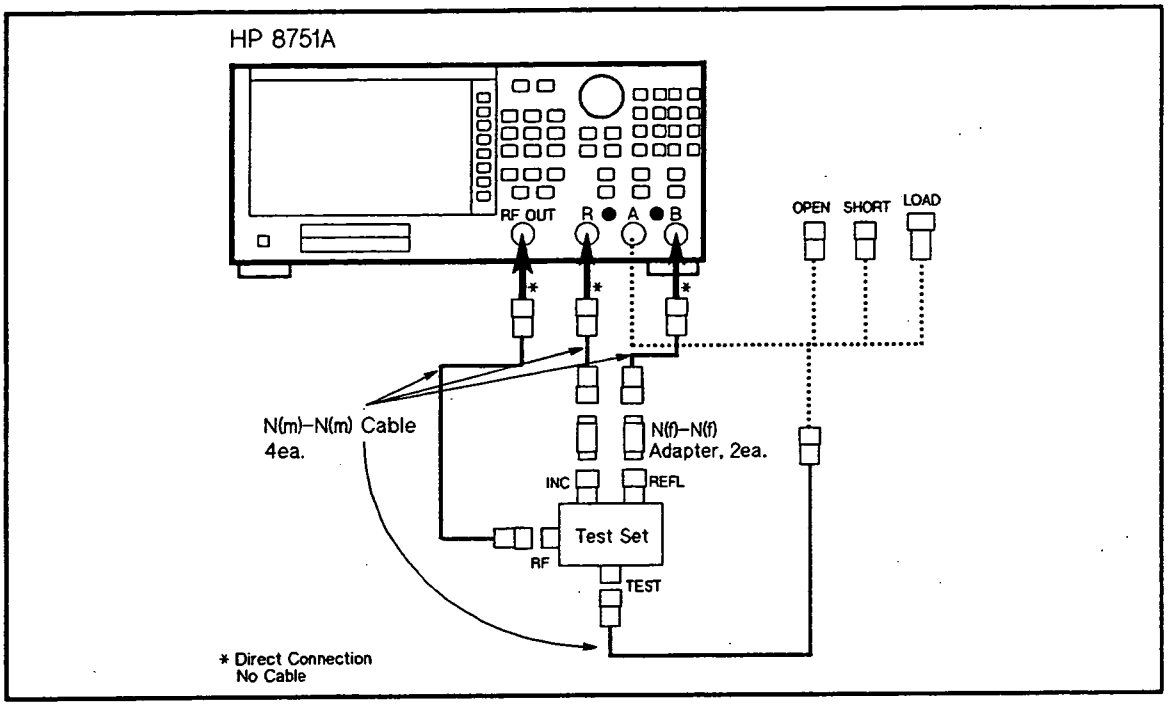

Figure 1-5. Input A Impedance Setup

b. Change the HP 8751A control settings as follows:

Control Settings	Key Strokes
START Freq. = 5 Hz	START, 5, x1
STOP Freq. = 100 MHz	STOP, 1, 0, 0, M/u
Meas. Config.: B/R	MEAS, B/R
IF BW: AUTO	AVG, IF BW, IF BW AUTO

c. Perform the following one port calibration sequence to do the one port calibration.

i. Press CAL, CAL KIT, N 50 Ω, RETURN, CALIBRATE MENU, S11 1-PORT

ii. Connect a type-N(f) open to the test port cable and press OPENS, OPEN [M], DONE:OPENS.

iii. Connect a type-N(f) short to the test port cable and press SHORTS, SHORT [M], DONE:SHORTS.

iv. Connect a type-N(f) 50 Ω Termination (LOAD) to the test port cable and press LOAD, DONE 1-PORT CAL.

d. Remove the 50 Ω Termination from the test port cable and connect the cable to the open input port of the analyzer.

e. Perform the following single sweep measurement key strokes.

(MENU), TRIGGER MENU, SINGLE

f. Press (SCALE REF), AUTO SCALE.

g. Change the sign of, and record the marker reading value into the *A return Loss (20 dB, 5 Hz to 100 MHz)* test result column into the Performance Test Record.

h. Press (ATTEN) and INPUT-A: 0 dB.

i. Perform the following single sweep measurement key strokes.

(MENU), TRIGGER MENU, SINGLE

j. Press (SCALE REF), AUTO SCALE.

k. Change the sign of, and record the marker reading value into the *A return Loss (0 dB, 5 Hz to 100 MHz)* test result column into the Performance Test Record.

l. Remove the cable from the INPUT-A Connector on the HP 8751A front panel.

m. Change the HP 8751A Control Settings as follows:

Control Settings	**Key Strokes**
START Freq. = 100 MHz	(START), (1), (0), (0), (M/u)
STOP Freq. = 500 MHz	(STOP), (5), (0), (0), (M/u)
IF BW: 200 Hz	(AVG), IF BW, (2), (0), (0), (x1)

n. Perform the following one port calibration sequence.

i. Press (CAL), CALIBRATE MENU, S11 1-PORT

ii. Connect a type-N(f) open to the test port cable and press OPENS, OPEN [M], DONE:OPENS.

iii. Connect a type-N(f) short to the test port cable and press SHORTS, SHORT [M], DONE:SHORTS.

iv. Connect a type-N(f) 50 Ω Termination (LOAD) to the test port cable and press LOAD, DONE 1-PORT CAL.

o. Remove the 50 Ω Termination from the test port cable and connect the cable to the open input port of the analyzer.

p. Perform the following single sweep measurement key strokes.

(MENU), TRIGGER MENU, SINGLE

q. Press (SCALE REF), AUTO SCALE.

r. Set the marker search range from 100 MHz to 300 MHz using the following key strokes.

(MKR), ACTIVATE MARKER, MARKER 1, (1), (0), (0), (M/u), ACTIVATE MARKER, MARKER 2, (3), (0), (0), (M/u), (MKR), Δ MODE MENU, Δ REF MARKER, Δ REF = 1, (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE, PART SRCH on/OFF

s. Move the marker to the maximum value using the following key strokes. Change the sign of, and record the maximum value into the *A Return Loss (0 dB, 100 MHz to 300 MHz)* test result column in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), Δ MODE MENU, Δ MODE OFF

t. Press Δ REF MARKER, Δ REF = 1.

u. Set the marker search range from 300 MHz to 500 MHz using the following key strokes.

(MKR), ACTIVATE MARKER, MARKER 1, (2), (0), (0), (M/u), (MKR), ACTIVATE MARKER, MARKER 2, (2), (0), (0), (M/u), (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE

v. Move the marker to the maximum value using the following key strokes. Change the sign of, and record the maximum value into the *A Return Loss (0 dB, 300 MHz to 500 MHz)* test result column in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), Δ MODE MENU, Δ MODE OFF

w. Press (ATTEN), INPUT-A: 20 dB.

x. Repeat steps p through v in Step 2 for A Return Loss at INPUT ATT: 20 dB.

3. *—Input R Impedance Test—*

a. Connect the equipment as shown in Figure 1-6.

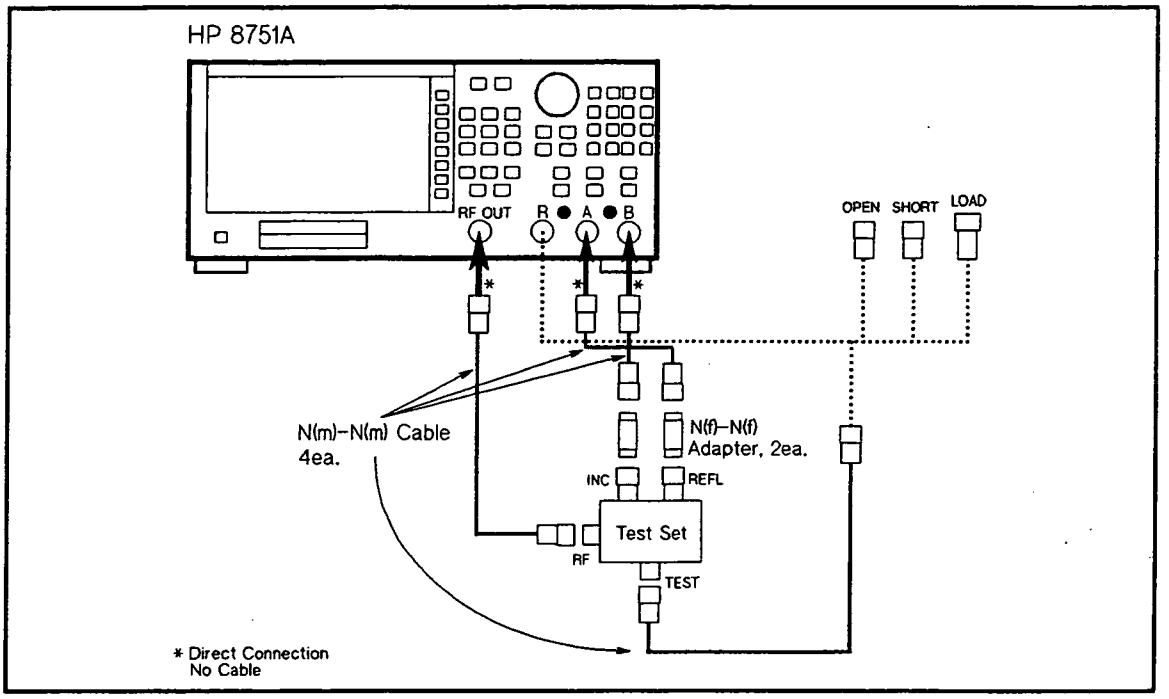

Figure 1-6. Input R Impedance Setup

b. Change the HP 8751A's settings as follows:

Control Settings	Key strokes
START Freq. = 5 Hz	START, 5, x1
STOP Freq. = 100 MHz	STOP, 1, 0, 0, M/u
Meas. Config.: A/B	MEAS, A/B
IF BW: AUTO	AVG, IF BW, IF BW AUTO

c. Perform the following one port calibration sequence.

i. Press CAL, CAL KIT, N 50 Ω, RETURN, CALIBRATE MENU, S11 1-PORT

ii. Connect a type-N(f) open to the test port cable and press OPENS, OPEN[M], DONE:OPENS.

iii. Connect a type-N(f) short to the test port cable and press SHORTS, SHORT[M], DONE:SHORTS.

iv. Connect a type-N(f) 50 Ω Termination (LOAD) to the test port cable and press LOAD, DONE 1-PORT CAL.

d. Remove the 50 Ω Termination from the test port cable and connect the cable to the open input port of the analyzer.

e. Perform the following single sweep measurement key strokes.

(MENU), TRIGGER MENU, SINGLE

f. Press (SCALE REF), AUTO SCALE.

g. Change the sign of, and record the marker reading value into the *R return Loss (20 dB, 5 Hz to 100 MHz)* test result column into the Performance Test Record.

h. Press (ATTEN) and INPUT-R: 0 dB.

i. Perform the following single sweep measurement key strokes.

(MENU), TRIGGER MENU, SINGLE

j. Press (SCALE REF), AUTO SCALE.

k. Change the sign of, and record the marker reading value into the *R return Loss (0 dB, 5 Hz to 100 MHz)* test result column into the Performance Test Record.

l. Remove the cable from the INPUT-R Connector on the HP 8751A front panel.

m. Change the HP 8751A Control Settings as follows:

Control Settings	**Key Strokes**
START Freq. = 100 MHz	(START), (1), (0), (0), (M/u)
STOP Freq. = 500 MHz	(STOP), (5), (0), (0), (M/u)
IF BW: 200 Hz	(AVG), IF BW, (2), (0), (0), (x1)

n. Perform the following one port calibration sequence.

i. Press (CAL), CALIBRATE MENU, S11 1-PORT

ii. Connect a type-N(f) open to the test port cable and press OPENS, OPEN[M], DONE:OPENS.

iii. Connect a type-N(f) short to the test port cable and press SHORTS, SHORT[M], DONE:SHORTS.

iv. Connect a type-N(f) 50 Ω Termination (LOAD) to the test port cable and press LOAD, DONE 1-PORT CAL.

o. Remove the 50 Ω Termination from the test port cable and connect the cable to the open input port of the analyzer.

p. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

q. Press (SCALE REF), AUTO SCALE.

r. Set the marker search range from 100 MHz to 300 MHz using the following key strokes.

(MKR), ACTIVATE MARKER, MARKER 1, (1), (0), (0), (M/u), ACTIVATE MARKER, MARKER 2, (3), (0), (0), (M/u), (MKR), Δ MODE MENU, Δ REF MARKER, Δ REF = 1, (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE, PART SRCH on/OFF

s. Move the marker to the maximum value using the following key strokes. Change the sign of, and record the maximum value into the *R Return Loss (0 dB, 100 MHz to 300 MHz)* test result column in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), Δ MODE MENU, Δ MODE OFF

t. Press Δ REF MARKER, Δ REF = 1.

u. Set the marker search range from 300 MHz to 500 MHz using the following key strokes.

(MKR), ACTIVATE MARKER, MARKER 1, (2), (0), (0), (M/u), (MKR), ACTIVATE MARKER, MARKER 2, (2), (0), (0), (M/u), (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE

v. Move the marker to the maximum value using the following key strokes. Change the sign of, and record the maximum value into the *R Return Loss (0 dB, 300 MHz to 500 MHz)* test result column in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), Δ MODE MENU, Δ MODE OFF

w. Press (ATTEN), INPUT-R: 20 dB.

x. Repeat steps p through v in Step 3 for R Return Loss at INPUT ATT: 20 dB.

CW FREQUENCY = 300 MHz

STOP Power	Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
-15 dBm	-20 dBm	-0.35 dB	_____	+0.35 dB	±0.090 dB
	-25 dBm	-0.50 dB	_____	+0.50 dB	±0.090 dB
	-30 dBm	-0.65 dB	_____	+0.65 dB	±0.090 dB
	-35 dBm	-0.80 dB	_____	+0.80 dB	±0.090 dB
	-40 dBm	-1.75 dB	_____	+1.75 dB	±0.090 dB
	-45 dBm	-1.90 dB	_____	+1.90 dB	±0.100 dB
	-50 dBm	-3.05 dB	_____	+3.05 dB	±0.151 dB
-20 dBm	-25 dBm	-0.35 dB	_____	+0.35 dB	±0.090 dB
	-30 dBm	-0.50 dB	_____	+0.50 dB	±0.090 dB
	-35 dBm	-0.65 dB	_____	+0.65 dB	±0.090 dB
	-40 dBm	-0.80 dB	_____	+0.80 dB	±0.090 dB
	-45 dBm	-1.75 dB	_____	+1.75 dB	±0.100 dB
	-50 dBm	-2.90 dB	_____	+2.90 dB	±0.151 dB
-25 dBm	-30 dBm	-0.35 dB	_____	+0.35 dB	±0.026 dB
	-35 dBm	-0.50 dB	_____	+0.50 dB	±0.026 dB
	-40 dBm	-0.65 dB	_____	+0.65 dB	±0.028 dB
	-45 dBm	-0.80 dB	_____	+0.80 dB	±0.052 dB
	-50 dBm	-1.95 dB	_____	+1.95 dB	±0.125 dB
-30 dBm	-35 dBm	-0.35 dB	_____	+0.35 dB	±0.026 dB
	-40 dBm	-0.50 dB	_____	+0.50 dB	±0.028 dB
	-45 dBm	-0.65 dB	_____	+0.65 dB	±0.053 dB
	-50 dBm	-1.80 dB	_____	+1.80 dB	±0.125 dB
-35 dBm	-40 dBm	-0.35 dB	_____	+0.35 dB	±0.029 dB
	-45 dBm	-0.50 dB	_____	+0.50 dB	±0.053 dB
	-50 dBm	-1.65 dB	_____	+1.65 dB	±0.126 dB
-40 dBm	-45 dBm	-0.35 dB	_____	+0.35 dB	±0.054 dB
	-50 dBm	-1.50 dB	_____	+1.50 dB	±0.126 dB
-45 dBm	-50 dBm	-1.35 dB	_____	+1.35 dB	±0.133 dB

CW FREQUENCY = 500 MHz

STOP Power	Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
-15 dBm	-20 dBm	-0.70 dB	_____	+0.70 dB	±0.090 dB
	-25 dBm	-1.20 dB	_____	+1.20 dB	±0.090 dB
	-30 dBm	-1.70 dB	_____	+1.70 dB	±0.090 dB
	-35 dBm	-2.20 dB	_____	+2.20 dB	±0.090 dB
	-40 dBm	-3.50 dB	_____	+3.50 dB	±0.090 dB
	-45 dBm	-4.00 dB	_____	+4.00 dB	±0.100 dB
	-50 dBm	-5.50 dB	_____	+5.50 dB	±0.151 dB
-20 dBm	-25 dBm	-0.70 dB	_____	+0.70 dB	±0.090 dB
	-30 dBm	-1.20 dB	_____	+1.20 dB	±0.090 dB
	-35 dBm	-1.70 dB	_____	+1.70 dB	±0.090 dB
	-40 dBm	-2.20 dB	_____	+2.20 dB	±0.090 dB
	-45 dBm	-3.50 dB	_____	+3.50 dB	±0.100 dB
	-50 dBm	-5.00 dB	_____	+5.00 dB	±0.151 dB
-25 dBm	-30 dBm	-0.70 dB	_____	+0.70 dB	±0.026 dB
	-35 dBm	-1.20 dB	_____	+1.20 dB	±0.026 dB
	-40 dBm	-1.70 dB	_____	+1.70 dB	±0.028 dB
	-45 dBm	-2.20 dB	_____	+2.20 dB	±0.052 dB
	-50 dBm	-3.70 dB	_____	+3.70 dB	±0.125 dB
-30 dBm	-35 dBm	-0.70 dB	_____	+0.70 dB	±0.026 dB
	-40 dBm	-1.20 dB	_____	+1.20 dB	±0.028 dB
	-45 dBm	-1.70 dB	_____	+1.70 dB	±0.053 dB
	-50 dBm	-3.20 dB	_____	+3.20 dB	±0.125 dB
-35 dBm	-40 dBm	-0.70 dB	_____	+0.70 dB	±0.029 dB
	-45 dBm	-1.20 dB	_____	+1.20 dB	±0.053 dB
	-50 dBm	-2.70 dB	_____	+2.70 dB	±0.126 dB
-40 dBm	-45 dBm	-0.70 dB	_____	+0.70 dB	±0.054 dB
	-50 dBm	-2.20 dB	_____	+2.20 dB	±0.126 dB
-45 dBm	-50 dBm	-1.70 dB	_____	+1.70 dB	±0.133 dB

HP 8751A
Network Analyzer

Maintenance Manual

MANUAL IDENTIFICATION

Model Number: HP 8751A
Date Printed: Nov. 1990
Part Number: 08751-90030

This supplement contains information for correcting manual errors and for adapting the manual to newer instruments that contains improvements or modifications not documented in the existing manual.

To use this supplement
1. Make all ERRATA corrections
2. Make all appropriate serial-number-related changes listed below

SERIAL PREFIX OR NUMBER	MAKE MANUAL CHANGES
3315J	1
3315A	1

FIRMWARE REVISION	MAKE MANUAL CHANGES
5.00	1

New Item

CHANGE 1

Page 1-3 and 1-4, Recommended Test Equipment

Change Table 1-1, Recommended Test Equipment, as follows:

NOTE

Manual change supplement are revised as often as necessary to keep manuals as current and accurate as possible. Hewlett-Packard recommends that you periodically request the latest edition of this supplement. Free copies are available from all HP offices. When requesting copies, quote the manual identification information from your supplement, or the model number and print date from the title page of the manual.

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Table 1-1. Recommended Test Equipment

Equipment	Critical Specifications	Recommended Model	Qty	Use[1]
Series 200/300 Controller	No substitute (BASIC Rev. 5.0 and above)	Model 310	1	A, T
Spectrum Analyzer	Frequency: 100 Hz to 1.5 GHz	HP 8566B or HP 8568B	1	P, A, T
Multimeter	No substitute	HP 3458A	1	P, A, T
Universal Source	DC Output: 0 to ±2 V, Accuracy: < 0.1%	HP 3245A	1	P, A
Frequency Counter	Frequency: 10 Hz to 500 MHz Accuracy: < 0.25 ppm	HP 5334B Opt. 010, 030	1	P, A
Power Meter	No substitute	HP 436A Opt.022, HP 437B, or HP 438A	1	P, A
Power Sensor	Frequency: 100 kHz to 500 MHz Power: +5 dBm to -20 dBm	HP 8482A	1	P, A
	Frequency: 10 MHz to 500 MHz Power: -20 to -60 dBm	HP 8481D	1	P
Ratio Transformer	No substitute	ESI 73 or ESI DT72A	1	P
Buffer Amplifier Set	No substitute	PN 08751-65003	1	P
Type-N Calibration Kit	No substitute	HP 85032B	1	P
Coaxial Loads	Type-N 50 Ω Termination	HP909C Opt.012	3	P, A, T
	50 Ω Feedthrough, BNC(m)-BNC(f)	PN 04192-61002 or HP 11048C	1	P, A
Program	Adjustments Program (3.5 in)	PN 08751-65002	1	A
Attenuator Pad	Impedance 50 Ω, N(m)-N(f)			
	ATT 10 dB	HP 8491A Opt. 010	2	P
	ATT 20 dB	HP 8491A Opt. 020[2]	1	P, A, T

1 P: Performance Tests, A: Adjustments and Correction Constants, T: Troubleshooting

2 An HP 8491A Opt. 020 must be calibrated at 1 MHz, 30 MHz, 50 MHz, 100 MHz, 300 MHz, and 500 MHz (Uncertainty: ≤ 0.06 dB). When you purchase an HP 8491A Opt. 020, contact your nearest Hewlett-Packard service center for the required calibration frequency and uncertainty.

Table 1-1. Recommended Test Equipment (continued)

Equipment	Critical Specifications	Recommended Model	Qty	Use[1]
Cables	RF Cable Set	HP 11851B	1	P
	50 Ω N(m)-N(m), 61 cm	HP 11500B	3	P, A, T
	50 Ω BNC(m)-BNC(m), 61 cm	PN 8120-1839	2	P, A
	50 Ω BNC(m)-BNC(m), 122 cm	PN 8120-1840	2	P, A
	50 Ω BNC(m)-SMB(f), 122 cm	PN 85680-60093	1	A, T
	50 Ω SMC(f)-SMC(f)	PN 08751-65006	1	T
	50 Ω SMC(m)-SMC(f)	PN 08751-65007	1	T
	HP-IB Cable	HP 10833A/B/C	3	A, T
Adapters	50 Ω, N(f)-N(f)	PN 1250-0777	2	P, A
	50 Ω, N(f)-BNC(f)	PN 1250-1474	1	A
	50 Ω, N(m)-N(m)	PN 1250-0778	1	P, A
	50 Ω, N(m)-BNC(f)	PN 1250-0780	2	P, A, T
	50 Ω, N(f)-BNC(m)	PN 1250-0077	1	A
	50 Ω SMC(m)-BNC(f)	PN 1250-1899	1	A, T
	50 Ω SMC(m)-N(m)	PN 1250-1023	1	A, T
	BNC(f)-Dual Banana Plug	PN 1251-2277	1	P, A
	Dual Banana Plug to Alligator Clip Lead	HP 11002A	1	A
	50 Ω, BNC(f)-BNC(f)	PN 1250-0080	1	P
Power Splitter	Freq. Range: > 500 MHz, Two-way	HP 11667A	1	P, A, T
	Freq. Range: > 500 MHz, Three-way	HP 11850C	1	P, A, T
T/R Test Kit	Frequency: 5 Hz to 500 MHz Directivity: ≥ 40 dB	HP 87512A	1	P
Extender Board	HP 8751A Extender Board Set	PN 08751-65005	1	A, T
Tool	Board Extractor	PN 08751-65012	1	T
Signal Generator	Frequency: 50 MHz Accuracy: < 1 ppm	HP 8656B Opt. 001	1	A

Page 2-8, Non-Harmonic Spurious Test

Change the table in step h of this test as follows:

HP 8751A Center Freq.	Spectrum Analyzer			
	CENTER	SPAN	RBW	Marker
450 MHz	450 MHz	20 kHz	300 Hz	Fundamental (f1)
	(f1) + 225 Hz	400 Hz	10 Hz	Spurious Max.
450.001 MHz	450.001 MHz	5 kHz	300 Hz	Fundamental (f2)
	(f2) + 5.5 kHz	10 kHz	100 Hz	Spurious Max.
450.01 MHz	450.01 MHz	5 kHz	300 Hz	Fundamental (f3)
	(f3) + 55 kHz	100 kHz	300 Hz	Spurious Max.
450.1 MHz	450.1 MHz	5 kHz	300 Hz	Fundamental (f4)
	(f4) + 550 kHz	1 MHz	300 Hz	Spurious Max.
426 MHz	426 MHz	5 kHz	300 Hz	Fundamental
	424 MHz	5 kHz	300 Hz	Spurious Max.

Page 2-45, Magnitude Ratio/Phase Dynamic Accuracy Test

Replace the test procedure with the procedure on pages 6 through 19 of this manual change sheet.

Page 2-68, Non-Harmonic Spurious Test Calculation Sheet

Change the calculation sheet in the Non-Harmonic Spurious Test as follows:

HP 8751A Center Frequency	Spectrum Analyzer Frequency	Spectrum Analyzer Reading	Test Result [-a+b]
450 MHz	f1 = _____	a = _____ dBm	
	f1 + 225 Hz = _____	b = _____ dBm	_____ dBc
450.001 MHz	f2 = _____	a = _____ dBm	
	f2 + 5.5 kHz = _____	b = _____ dBm	_____ dBc
450.01 MHz	f3 = _____	a = _____ dBm	
	f3 + 55 kHz = _____	b = _____ dBm	_____ dBc
450.1 MHz	f4 = _____	a = _____ dBm	
	f4 + 550 kHz = _____	b = _____ dBm	_____ dBc
426 MHz	426 MHz	a = _____ dBm	
	424 MHz	b = _____ dBm	_____ dBc

Page 2-79, Magnitude/Phase Dynamic Accuracy Test Calculation Sheet

Change the calculation sheet according to page 20 of this manual change sheet.

Page 2-83, Non-Harmonic Spurious Test in the Performance Test Record

Change the test record sheet as follows:

Non-Harmonic Spurious Test

Frequency	Test Result	Test Limit	Measurement Uncertainty
450 MHz	_____	< −45 dBc	±2.05 dB
450.001 MHz	_____	< −45 dBc	±2.05 dB
450.01 MHz	_____	< −45 dBc	±2.05 dB
450.1 MHz	_____	< −45 dBc	±2.05 dB
426 MHz	_____	< −45 dBc	±2.05 dB

Page 2-99, Magnitude Ratio/Phase Dynamic Accuracy Test in the Performance Test Record

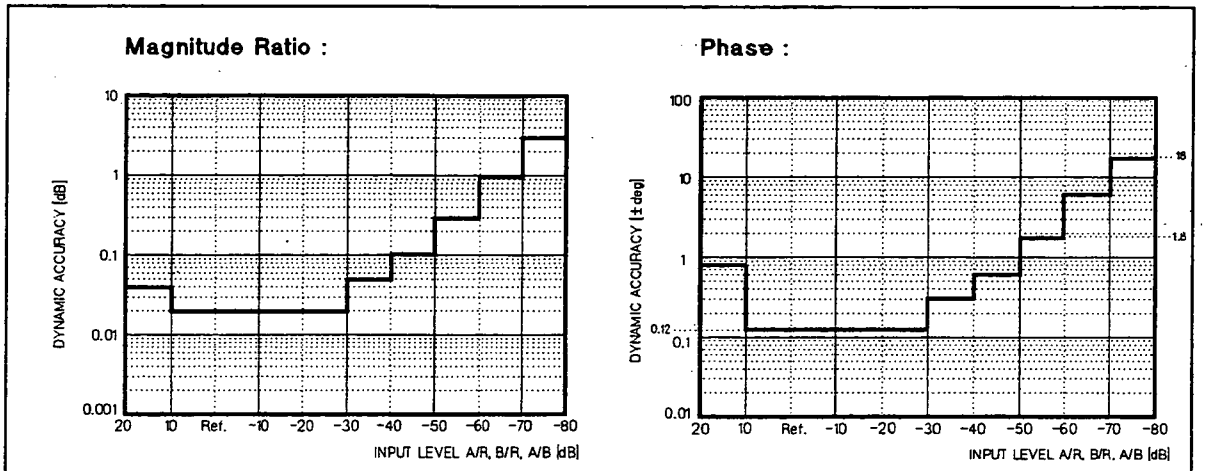
Change the test record sheet according to pages 21 through 23 of this manual change sheet.

MAGNITUDE RATIO/PHASE DYNAMIC ACCURACY TEST

This test measures the HP 8751A's Dynamic Accuracy. The dynamic accuracy is a measure of how well the receiver measures the magnitude and phase components of a signal as that signal varies in amplitude over the specified dynamic range.

Specification

Figure 1-1 shows the specification (at constant temperature within 23 ± 5°C, 20 Hz bandwidth, Freq. ≥ 500 Hz).



Input Level: A/R and B/R - Rch. Input Level = -20 dBm (@ATT = 20 dB) or -40 dBm (@ATT = 0 dB)

A/B - Bch. Input Level = -20 dBm (@ATT = 20 dB) or -40 dBm (@ATT = 0 dB)

Assumption: Ref. Input Level = -20 dBm (@ATT = 20 dB) or -40 dBm (@ATT = 0dB)

Averaging Factor:

Input Level A/R, B/R, A/R [dB]	Averaging Factor
20 to -20	1
-20 to -40	4
-40 to -50	8
-50 to -60	32
-60 to -70	128
-70 to -80	256

8751A\2n66

Figure 1-1. Magnitude Ratio/Phase Dynamic Accuracy Specification

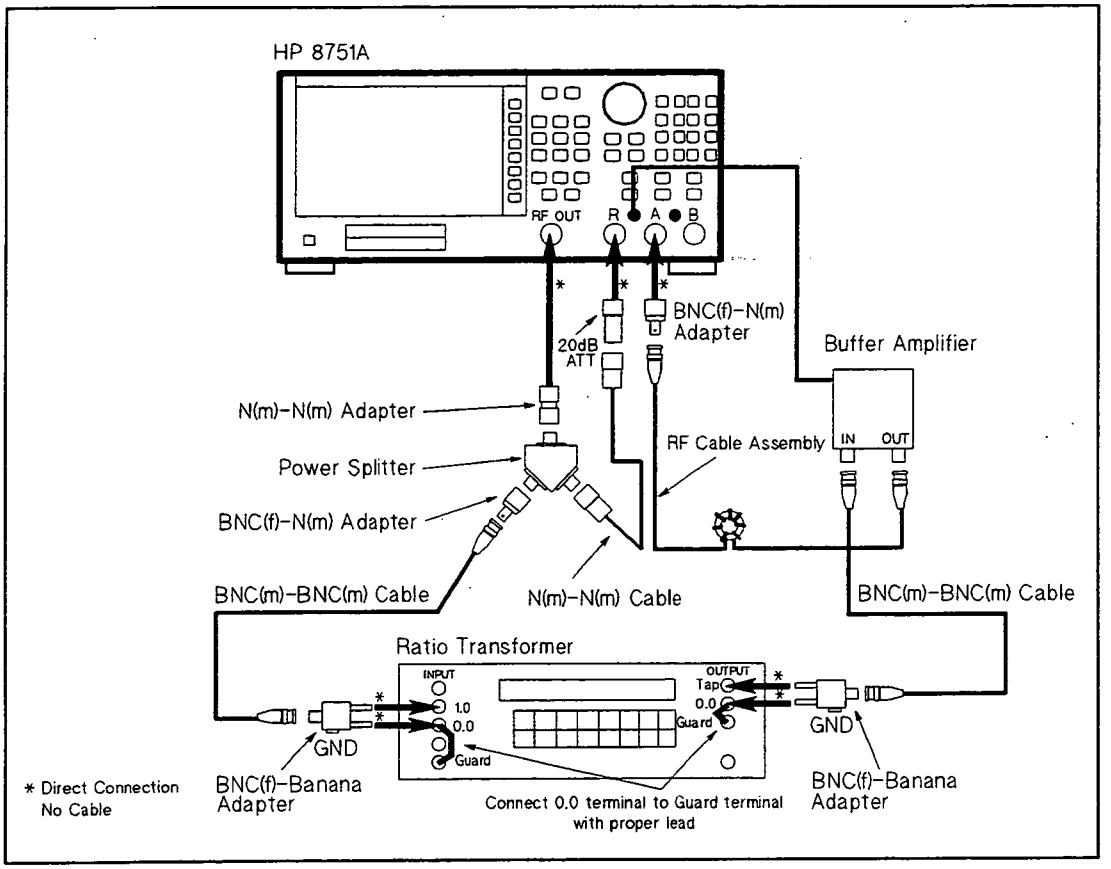
Test Equipment

Ratio Transformer	ESI 73 or ESI DT72A
Buffer Amplifier Set	PN 08751-65003 (incl. RF Cable Assembly)
Power Splitter	HP 11667A
Attenuator Pad 20 dB	HP8491A Opt.020
BNC(m)-BNC(m) Cable, 61 cm	PN 8120-1839, 2 ea
BNC(f)-BNC(f) Adapter	PN 1251-0080, 1 ea
BNC(f)-N(m) Adapter	PN 1250-0780, 2 ea
BNC(f)-Banana Adapter	PN 1251-2277, 2 ea
N(m)-N(m) Cable, 61 cm	HP11500B, 1 ea
N(m)-N(m) Adapter	PN 1250-1475, 1 ea

Procedure

1. *—A/R Dynamic Accuracy Test—*

   a. Connect the test equipment as shown in Figure 1-2.



8751A-N63A

Figure 1-2. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 1

   b. Set the ratio setting of the Ratio Transformer to 1.

   c. Set the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
CH1: A/R, LOG MAG	[CH 1], [MEAS], A/R, [FORMAT], LOG MAG
CH2: A/R, PHASE	[CH 2], [MEAS], A/R, [FORMAT], PHASE
Dual Channel: ON	[DISPLAY], DUAL CHAN on/OFF
CENTER Freq. = 500 Hz	[CENTER], [5], [0], [0], [x1]
SPAN Freq. = 0 Hz	[SPAN], [0], [x1]
Number of Points = 2	[MENU], NUMBER of POINTS, [2], [x1]
Source Power = −16.5 dBm	[MENU], POWER, [−], [1], [6], [.], [5], [x1]
IF BW: 20 Hz	[AVG], IF BW, [2], [0], [x1]

CH1: AVG Factor: 1, AVG: ON	(CH 1), (AVG), AVERAGING FACTOR, (1), (x1), AVERAGING on/OFF
CH2: AVG Factor: 1, AVG: ON	(CH 2), (AVG), AVERAGING FACTOR, (1), (x1), AVERAGING on/OFF
Markers: Discrete, Coupled	(MKR), MARKER MODE MENU, MARKERS:DISCRETE, MARKERS:COUPLED
ATTEN: Input-A = 20 dB	(ATTEN), INPUT-A: 20dB
ATTEN: Input-R = 0 dB	(ATTEN), INPUT-R: 0dB

d. Perform the following key strokes to do a pass loss calibration:

(CAL), CAL KIT, CAL KIT: N 50Ω, (CAL), CALIBRATE MENU, RESPONSE, THRU, DONE:RESPONSE

e. Set the ratio setting of the Ratio Transformer to 0.3162278.

f. Perform the following key strokes for a single sweep measurement:

(MENU), TRIGGER MENU, SINGLE

g. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

h. Set the ratio setting of the Ratio Transformer to 0.1.

i. Perform the following key strokes for a single sweep measurement:

(MENU), TRIGGER MENU, SINGLE

j. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

k. Press (CH 1), (AVG), AVERAGING FACTOR, (4), (x1), (CH 2), (4), (x1) to change the averaging factor from 1 to 4.

l. Set the ratio setting of the Ratio Transformer to 0.0316228.

m. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (4), (x1)

n. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

o. Set the ratio setting of the Ratio Transformer to 0.01.

p. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (4), (x1)

q. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

r. Press (CH 1), (AVG), AVERAGING FACTOR, (8), (x1), (CH 2), (8), (x1) to change the averaging factor from 4 to 8.

s. Set the ratio setting of the Ratio Transformer to 0.0031623.

t. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, 8, (x1)

u. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

v. Press (CH 1), (AVG), AVERAGING FACTOR, 3, 2, (x1), (CH 2), 3, 2, (x1) to change the averaging factor from 8 to 32.

w. Set the ratio setting of the Ratio Transformer to 0.001.

x. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, 3, 2, (x1)

y. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

z. Press (CH 1), (AVG), AVERAGING FACTOR, 1, 2, 8, (x1), (CH 2), 1, 2, 8, (x1) to change the averaging factor from 32 to 128.

aa. Set the ratio setting of the Ratio Transformer to 0.0003162.

bb. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, 1, 2, 8, (x1)

cc. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

dd. Press (CH 1), (AVG), AVERAGING FACTOR, 2, 5, 6, (x1), (CH 2), 2, 5, 6, (x1) to change the averaging factor from 128 to 256.

ee. Set the ratio setting of the Ratio Transformer to 0.0001.

ff. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, 2, 5, 6, (x1)

gg. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

hh. Press (MENU), POWER, 3, (.), 5, (x1) to change the output power from −16.5 dBm to +3.5 dBm.

ii. Press (CH 1), (AVG), AVERAGING FACTOR, 1, (x1), (CH 2), 1, (x1) to change the averaging factor from 256 to 1.

jj. Press (ATTEN), INPUT-R: 20dB to set the R-ch input attenuator to 20 dB.

kk. Set the ratio setting of the Ratio Transformer to 0.1.

ll. Perform the following key strokes to do a pass loss calibration:

(CAL), CALIBRATE MENU, RESPONSE, THRU, DONE:RESPONSE

mm. Set the ratio setting of the Ratio Transformer to 0.5011872.

nn. Perform the following key strokes for a single sweep measurement:

(MENU), TRIGGER MENU, SINGLE

oo. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

pp. Set the ratio setting of the Ratio Transformer to 0.3162278.

qq. Perform the following key strokes for a single sweep measurement:

(MENU), TRIGGER MENU, SINGLE

rr. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

2. *—B/R Dynamic Accuracy Test—*

a. Connect the test equipment as shown in Figure 1-3.

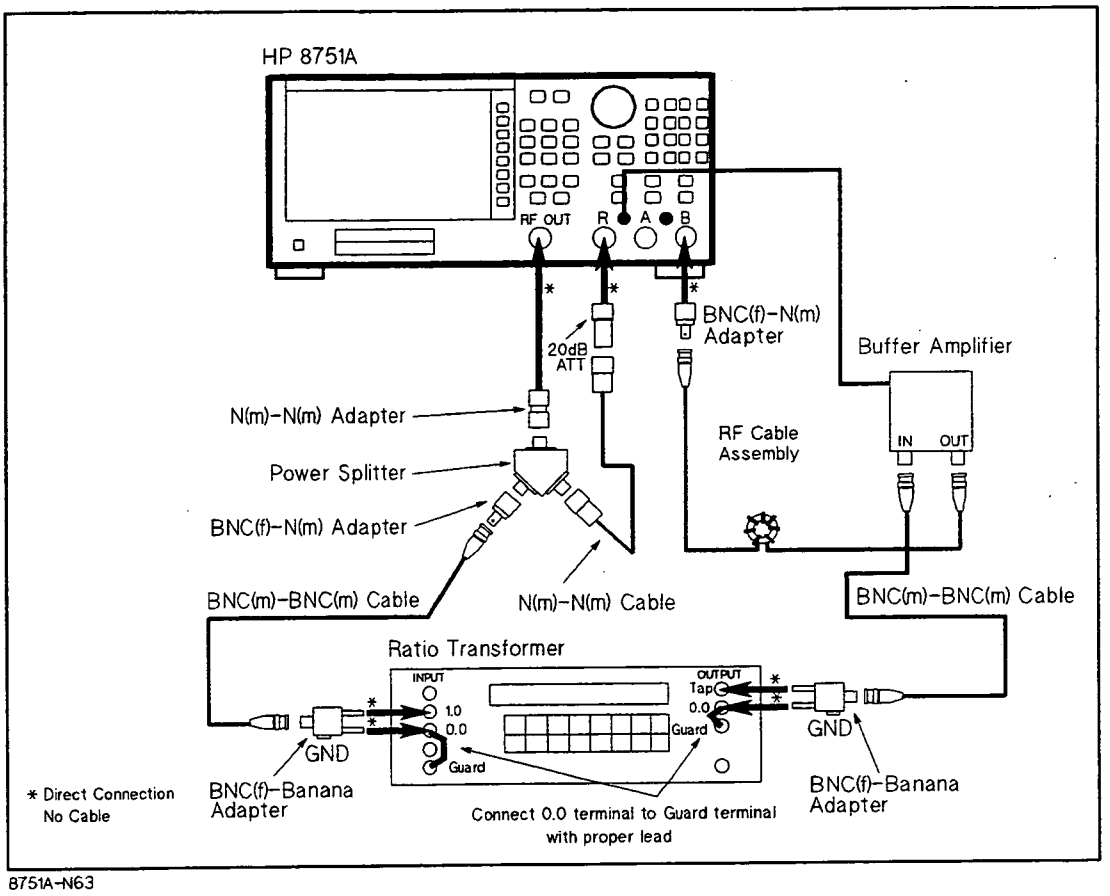


Figure 1-3. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 1

b. Set the ratio setting of the Ratio Transformer to 1.

c. Change the HP 8751A control settings as follows:

Control Settings	Key Strokes
CH1: B/R, LOG MAG	CH 1, MEAS, B/R, FORMAT, LOG MAG
CH2: B/R, PHASE	CH 2, MEAS, B/R, FORMAT, PHASE
Source Power = −16.5 dBm	MENU, POWER, (−), 1, 6, ., 5, x1
ATTEN: Input-B = 20 dB	ATTEN, INPUT-B: 20dB
ATTEN: Input-R = 0 dB	ATTEN, INPUT-R: 0dB

d. Perform the following key strokes to do a pass loss calibration:

CAL, CALIBRATE MENU, RESPONSE, THRU, DONE-RESPONSE

e. Set the ratio setting of the Ratio Transformer to 0.3162278.

f. Perform the following key strokes for a single sweep measurement:

(MENU), TRIGGER MENU, SINGLE

g. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

h. Set the ratio setting of the Ratio Transformer to 0.1.

i. Perform the following key strokes for a single sweep measurement:

(MENU), TRIGGER MENU, SINGLE

j. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

k. Press (CH 1), (AVG), AVERAGING FACTOR, (4), (x1), (CH 2), (4), (x1) to change the averaging factor from 1 to 4.

l. Set the ratio setting of the Ratio Transformer to 0.0316228.

m. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (4), (x1)

n. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

o. Set the ratio setting of the Ratio Transformer to 0.01.

p. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (4), (x1)

q. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

r. Press (CH 1), (AVG), AVERAGING FACTOR, (8), (x1), (CH 2), (8), (x1) to change the averaging factor from 4 to 8.

s. Set the ratio setting of the Ratio Transformer to 0.0031623.

t. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (8), (x1)

u. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

v. Press (CH 1), (AVG), AVERAGING FACTOR, (3), (2), (x1), (CH 2), (3), (2), (x1) to change the averaging factor from 8 to 32.

w. Set the ratio setting of the Ratio Transformer to 0.001.

x. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (3), (2), (x1)

y. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

z. Press (CH 1), (AVG), AVERAGING FACTOR, (1), (2), (8), (x1), (CH 2), (1), (2), (8), (x1) to change the averaging factor from 32 to 128.

aa. Set the ratio setting of the Ratio Transformer to 0.0003162.

bb. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (1), (2), (8), (x1)

cc. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

dd. Press (CH 1), (AVG), AVERAGING FACTOR, (2), (5), (6), (x1), (CH 2), (2), (5), (6), (x1) to change the averaging factor from 128 to 256.

ee. Set the ratio setting of the Ratio Transformer to 0.0001.

ff. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (2), (5), (6), (x1)

gg. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

hh. Press (MENU), POWER, (3), (.), (5), (x1) to change the output power from −16.5 dBm to +3.5 dBm.

ii. Press (CH 1), (AVG), AVERAGING FACTOR, (1), (x1), (CH 2), (1), (x1) to change the averaging factor from 256 to 1.

jj. Press (ATTEN), INPUT-R: 20dB to set the R-ch input attenuator to 20 dB.

kk. Set the ratio setting of the Ratio Transformer to 0.1.

ll. Perform the following key strokes to do a pass loss calibration:

(CAL), CALIBRATE MENU, RESPONSE, THRU, DONE:RESPONSE

mm. Set the ratio setting of the Ratio Transformer to 0.5011872.

nn. Perform the following key strokes for a single sweep measurement:

(MENU), TRIGGER MENU, SINGLE

oo. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

pp. Set the ratio setting of the Ratio Transformer to 0.3162278.

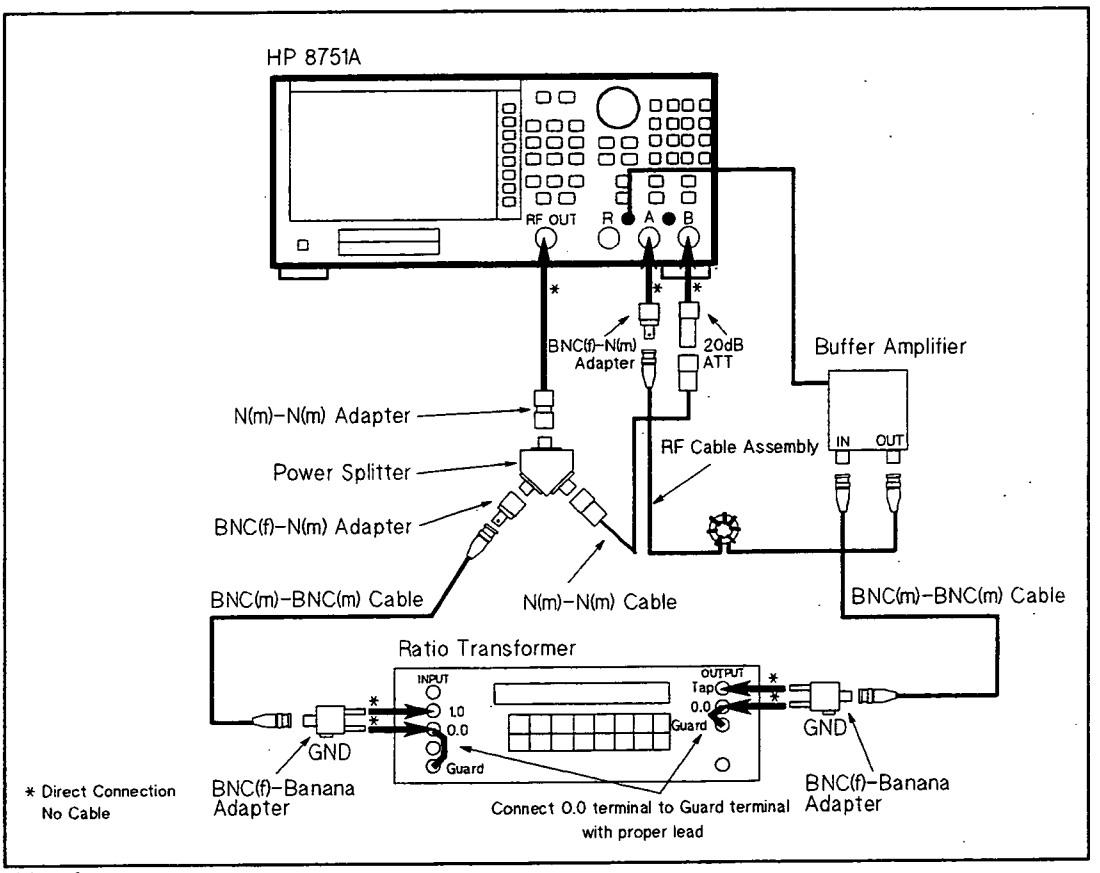
qq. Perform the following key strokes for a single sweep measurement:

(MENU), TRIGGER MENU, SINGLE

rr. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

3. *—A/B Dynamic Accuracy Test—*

a. Connect the test equipment as shown in Figure 1-4.



8751A-N64

Figure 1-4. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 1

b. Set the ratio setting of the Ratio Transformer to 1.

c. Change the HP 8751A control settings as follows:

Control Settings	Key Strokes
CH1: A/B, LOG MAG	CH 1, MEAS, A/B, FORMAT, LOG MAG
CH2: A/B, PHASE	CH 2, MEAS, A/B, FORMAT, PHASE
Number of Points = 2	MENU, NUMBER of POINTS, 2, x1
Source Power = −16.5 dBm	MENU, POWER, −, 1, 6, ., 5, x1
ATTEN: Input-A = 20 dB	ATTEN, INPUT-A: 20dB
ATTEN: Input-B = 0 dB	ATTEN, INPUT-B: 0dB

d. Perform the following key strokes to do a pass loss calibration:

CAL, CALIBRATE MENU, RESPONSE, THRU, DONE:RESPONSE

e. Set the ratio setting of the Ratio Transformer to 0.3162278.

f. Perform the following key strokes for a single sweep measurement:

(MENU), TRIGGER MENU, SINGLE

g. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

h. Set the ratio setting of the Ratio Transformer to 0.1.

i. Perform the following key strokes for a single sweep measurement:

(MENU), TRIGGER MENU, SINGLE

j. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

k. Press (CH 1), (AVG), AVERAGING FACTOR, (4), (x1), (CH 2), (4), (x1) to change the averaging factor from 1 to 4.

l. Set the ratio setting of the Ratio Transformer to 0.0316228.

m. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (4), (x1)

n. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

o. Set the ratio setting of the Ratio Transformer to 0.01.

p. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (4), (x1)

q. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

r. Press (CH 1), (AVG), AVERAGING FACTOR, (8), (x1), (CH 2), (8), (x1) to change the averaging factor from 4 to 8.

s. Set the ratio setting of the Ratio Transformer to 0.0031623.

t. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (8), (x1)

u. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

v. Press (CH 1), (AVG), AVERAGING FACTOR, (3), (2), (x1), (CH 2), (3), (2), (x1) to change the averaging factor from 8 to 32.

w. Set the ratio setting of the Ratio Transformer to 0.001.

x. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (3), (2), (x1)

y. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

z. Press (CH 1), (AVG), AVERAGING FACTOR, (1), (2), (8), (x1), (CH 2), (1), (2), (8), (x1) to change the averaging factor from 32 to 128.

aa. Set the ratio setting of the Ratio Transformer to 0.0003162.

bb. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (1), (2), (8), (x1)

cc. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

dd. Press (CH 1), (AVG), AVERAGING FACTOR, (2), (5), (6), (x1), (CH 2), (2), (5), (6), (x1) to change the averaging factor from 128 to 256.

ee. Set the ratio setting of the Ratio Transformer to 0.0001.

ff. Perform the following key strokes for a measurement:

(MENU), TRIGGER MENU, NUMBER OF GROUPS, (2), (5), (6), (x1)

gg. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

hh. Press (MENU), POWER, (3), (.), (5), (x1) to change the output power from −16.5 dBm to +3.5 dBm.

ii. Press (CH 1), (AVG), AVERAGING FACTOR, (1), (x1), (CH 2), (1), (x1) to change the averaging factor from 256 to 1.

jj. Press (ATTEN), INPUT-B: 20dB to set the B-ch input attenuator to 20 dB.

kk. Set the ratio setting of the Ratio Transformer to 0.1.

ll. Perform the following key strokes to do a pass loss calibration:

(CAL), CALIBRATE MENU, RESPONSE, THRU, DONE:RESPONSE

mm. Set the ratio setting of the Ratio Transformer to 0.5011872.

nn. Perform the following key strokes for a single sweep measurement:

(MENU), TRIGGER MENU, SINGLE

oo. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

pp. Set the ratio setting of the Ratio Transformer to 0.3162278.

qq. Perform the following key strokes for a single sweep measurement:

(MENU), TRIGGER MENU, SINGLE

rr. Read the magnitude ratio value and phase at 500 Hz. Record these values on the Calculation Sheet.

Buffer Amplifier Operation Check

The following description shows an operation check procedure for the Buffer Amplifier.

1. Connect the test equipment as shown in Figure 1-5.

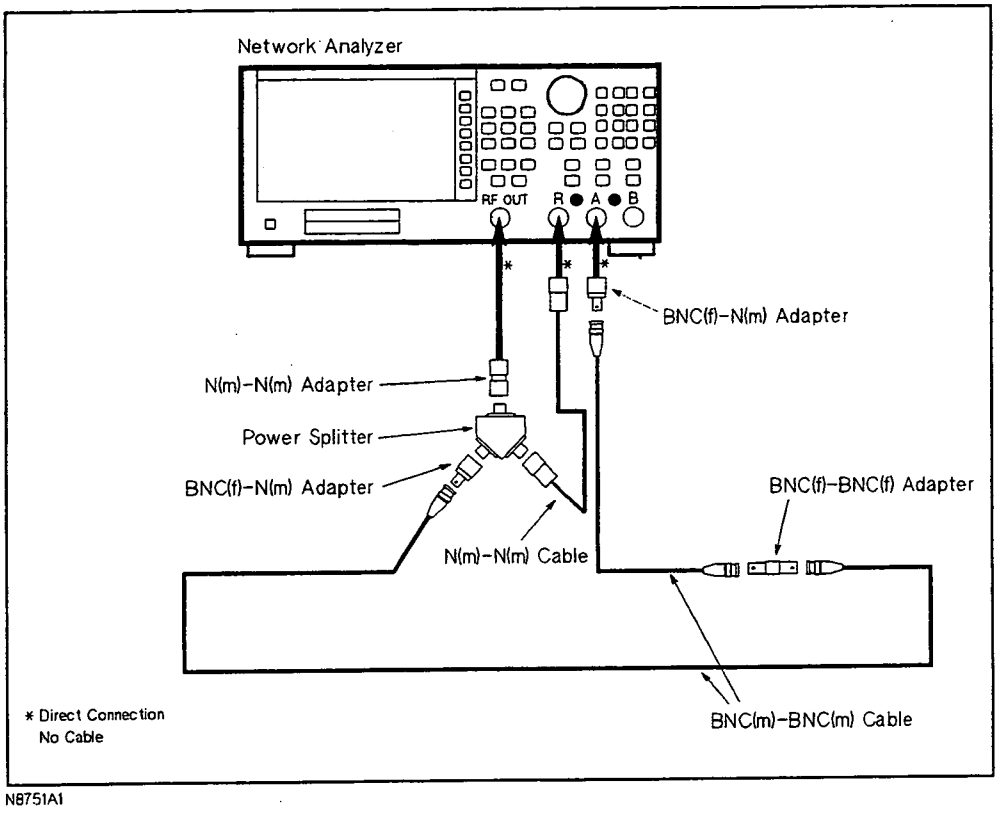


Figure 1-5. Buffer Amplifier Performance Check Setup 1

2. Set the Network Analyzer as follows:

Source Power	−3.5 dBm
START Freq.	100 Hz
STOP Freq.	1 MHz
Sweep Type	LOG FREQ
CH1	A/R, LOG MAG
CH2	A/R, PHASE
IF BW	20 Hz

3. Perform the pass loss calibration.
4. Replace the BNC(f)-BNC(f) Adapter with the Buffer Amplifier as shown in Figure 1-6.

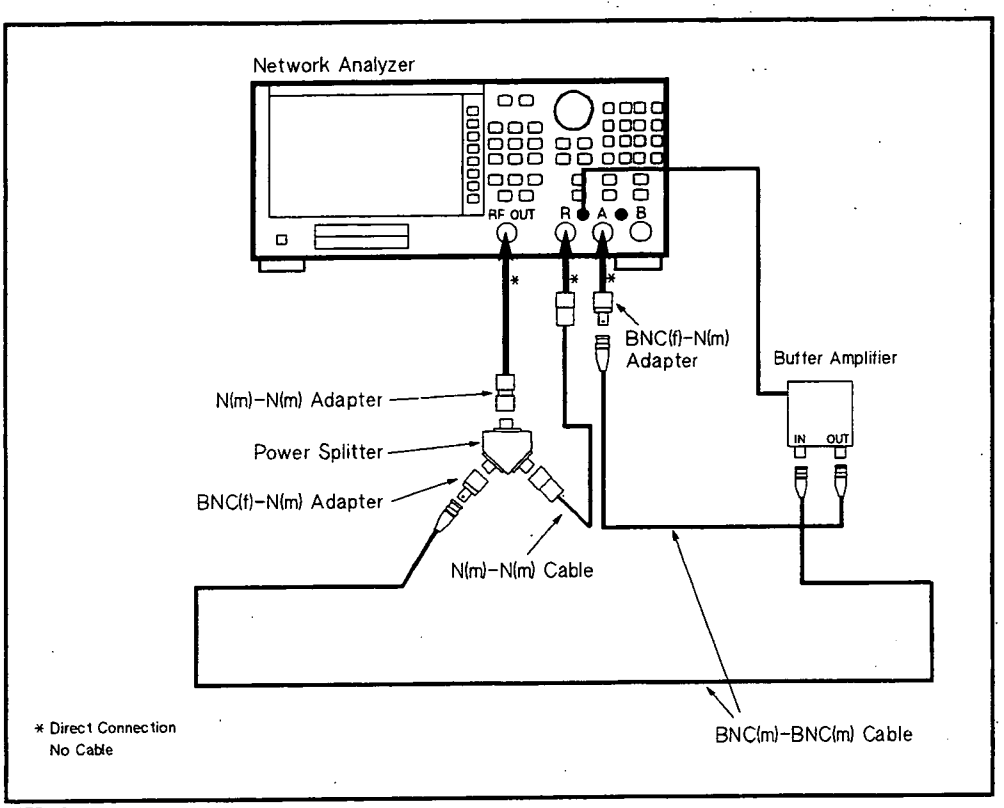


Figure 1-6. Buffer Amplifier Performance Check Setup 2

5. Perform a single sweep measurement.
6. Read the magnitude ratio difference and phase difference value at 3 kHz from the reference value at 100 Hz with Markers.
7. When the difference value is within the following limits, the Buffer Amplifier operation is adequate to do the magnitude ratio/phase dynamic accuracy test of the HP 8751A:

Difference Value	**Test Limit**
Gain	±0.1 dB
Phase	±20 °

Magnitude Ratio/Phase Dynamic Accuracy Test

A/R Dynamic Accuracy (Mag. Ratio, Phase) Test

Source Power	Ratio Trans. Setting	Phase	Mag. Ratio [a]		Test Result	A Input Level
+3.5 dBm	0.5011872	_____ deg	_____ dB	a−14	_____ dB	−6 dBm
+3.5 dBm	0.3162278	_____ deg	_____ dB	a−10	_____ dB	−10 dBm
−16.5 dBm	0.3162278	_____ deg	_____ dB	a+10	_____ dB	−30 dBm
−16.5 dBm	0.1	_____ deg	_____ dB	a+20	_____ dB	−40 dBm
−16.5 dBm	0.0316228	_____ deg	_____ dB	a+30	_____ dB	−50 dBm
−16.5 dBm	0.01	_____ deg	_____ dB	a+40	_____ dB	−60 dBm
−16.5 dBm	0.0031623	_____ deg	_____ dB	a+50	_____ dB	−70 dBm
−16.5 dBm	0.001	_____ deg	_____ dB	a+60	_____ dB	−80 dBm
−16.5 dBm	0.0003162	_____ deg	_____ dB	a+70	_____ dB	−90 dBm
−16.5 dBm	0.0001	_____ deg	_____ dB	a+80	_____ dB	−100 dBm

B/R Dynamic Accuracy (Mag. Ratio, Phase) Test

Source Power	Ratio Trans. Setting	Phase	Mag. Ratio [a]		Test Result	B Input Level
+3.5 dBm	0.5011872	_____ deg	_____ dB	a−14	_____ dB	−6 dBm
+3.5 dBm	0.3162278	_____ deg	_____ dB	a−10	_____ dB	−10 dBm
−16.5 dBm	0.3162278	_____ deg	_____ dB	a+10	_____ dB	−30 dBm
−16.5 dBm	0.1	_____ deg	_____ dB	a+20	_____ dB	−40 dBm
−16.5 dBm	0.0316228	_____ deg	_____ dB	a+30	_____ dB	−50 dBm
−16.5 dBm	0.01	_____ deg	_____ dB	a+40	_____ dB	−60 dBm
−16.5 dBm	0.0031623	_____ deg	_____ dB	a+50	_____ dB	−70 dBm
−16.5 dBm	0.001	_____ deg	_____ dB	a+60	_____ dB	−80 dBm
−16.5 dBm	0.0003162	_____ deg	_____ dB	a+70	_____ dB	−90 dBm
−16.5 dBm	0.0001	_____ deg	_____ dB	a+80	_____ dB	−100 dBm

A/B Dynamic Accuracy (Mag. Ratio, Phase) Test

Source Power	Ratio Trans. Setting	Phase	Mag. Ratio [a]		Test Result	A Input Level
+3.5 dBm	0.5011872	_____ deg	_____ dB	a−14	_____ dB	−6 dBm
+3.5 dBm	0.3162278	_____ deg	_____ dB	a−10	_____ dB	−10 dBm
−16.5 dBm	0.3162278	_____ deg	_____ dB	a+10	_____ dB	−30 dBm
−16.5 dBm	0.1	_____ deg	_____ dB	a+20	_____ dB	−40 dBm
−16.5 dBm	0.0316228	_____ deg	_____ dB	a+30	_____ dB	−50 dBm
−16.5 dBm	0.01	_____ deg	_____ dB	a+40	_____ dB	−60 dBm
−16.5 dBm	0.0031623	_____ deg	_____ dB	a+50	_____ dB	−70 dBm
−16.5 dBm	0.001	_____ deg	_____ dB	a+60	_____ dB	−80 dBm
−16.5 dBm	0.0003162	_____ deg	_____ dB	a+70	_____ dB	−90 dBm
−16.5 dBm	0.0001	_____ deg	_____ dB	a+80	_____ dB	−100 dBm

Magnitude Ratio/Phase Dynamic Accuracy Test

A/R Dynamic Accuracy (Magnitude Ratio and Phase) Test

Magnitude Ratio.

A Input Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
−6 dBm	−0.04 dB	_____	+0.04 dB	±0.001 dB
−10 dBm	−0.02 dB	_____	+0.02 dB	±0.001 dB
−30 dBm	−0.02 dB	_____	+0.02 dB	±0.004 dB
−40 dBm	−0.02 dB	_____	+0.02 dB	±0.004 dB
−50 dBm	−0.02 dB	_____	+0.02 dB	±0.004 dB
−60 dBm	−0.05 dB	_____	+0.05 dB	±0.004 dB
−70 dBm	−0.1 dB	_____	+0.1 dB	±0.014 dB
−80 dBm	−0.3 dB	_____	+0.3 dB	±0.030 dB
−90 dBm	−1.0 dB	_____	+1.0 dB	±0.096 dB
−100 dBm	−3.0 dB	_____	+3.0 dB	±0.288 dB

Phase.

A Input Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
−6 dBm	−0.8 °	_____	+0.8 °	±0.029 °
−10 dBm	−0.12 °	_____	+0.12 °	±0.029 °
−30 dBm	−0.12 °	_____	+0.12 °	±0.007 °
−40 dBm	−0.12 °	_____	+0.12 °	±0.008 °
−50 dBm	−0.12 °	_____	+0.12 °	±0.014 °
−60 dBm	−0.3 °	_____	+0.3 °	±0.041 °
−70 dBm	−0.6 °	_____	+0.6 °	±0.143 °
−80 dBm	−1.8 °	_____	+1.8 °	±0.402 °
−90 dBm	−6.0 °	_____	+6.0 °	±1.262 °
−100 dBm	−18.0 °	_____	+18.0 °	±4.065 °

B/R Dynamic Accuracy (Magnitude Ratio and Phase) Test

Magnitude Ratio.

B Input Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
−6 dBm	−0.04 dB	_____	+0.04 dB	±0.001 dB
−10 dBm	−0.02 dB	_____	+0.02 dB	±0.001 dB
−30 dBm	−0.02 dB	_____	+0.02 dB	±0.004 dB
−40 dBm	−0.02 dB	_____	+0.02 dB	±0.004 dB
−50 dBm	−0.02 dB	_____	+0.02 dB	±0.004 dB
−60 dBm	−0.05 dB	_____	+0.05 dB	±0.004 dB
−70 dBm	−0.1 dB	_____	+0.1 dB	±0.014 dB
−80 dBm	−0.3 dB	_____	+0.3 dB	±0.030 dB
−90 dBm	−1.0 dB	_____	+1.0 dB	±0.096 dB
−100 dBm	−3.0 dB	_____	+3.0 dB	±0.288 dB

Phase.

B Input Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
−6 dBm	−0.8 °	_____	+0.8 °	±0.029 °
−10 dBm	−0.12 °	_____	+0.12 °	±0.029 °
−30 dBm	−0.12 °	_____	+0.12 °	±0.007 °
−40 dBm	−0.12 °	_____	+0.12 °	±0.008 °
−50 dBm	−0.12 °	_____	+0.12 °	±0.014 °
−60 dBm	−0.3 °	_____	+0.3 °	±0.041 °
−70 dBm	−0.6 °	_____	+0.6 °	±0.143 °
−80 dBm	−1.8 °	_____	+1.8 °	±0.402 °
−90 dBm	−6.0 °	_____	+6.0 °	±1.262 °
−100 dBm	−18.0 °	_____	+18.0 °	±4.065 °

A/B Dynamic Accuracy (Magnitude Ratio and Phase) Test

Magnitude Ratio.

A Input Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
−6 dBm	−0.04 dB	_____	+0.04 dB	±0.001 dB
−10 dBm	−0.02 dB	_____	+0.02 dB	±0.001 dB
−30 dBm	−0.02 dB	_____	+0.02 dB	±0.004 dB
−40 dBm	−0.02 dB	_____	+0.02 dB	±0.004 dB
−50 dBm	−0.02 dB	_____	+0.02 dB	±0.004 dB
−60 dBm	−0.05 dB	_____	+0.05 dB	±0.004 dB
−70 dBm	−0.1 dB	_____	+0.1 dB	±0.014 dB
−80 dBm	−0.3 dB	_____	+0.3 dB	±0.030 dB
−90 dBm	−1.0 dB	_____	+1.0 dB	±0.096 dB
−100 dBm	−3.0 dB	_____	+3.0 dB	±0.288 dB

Phase.

A Input Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
−6 dBm	−0.8 °	_____	+0.8 °	±0.029 °
−10 dBm	−0.12 °	_____	+0.12 °	±0.029 °
−30 dBm	−0.12 °	_____	+0.12 °	±0.007 °
−40 dBm	−0.12 °	_____	+0.12 °	±0.008 °
−50 dBm	−0.12 °	_____	+0.12 °	±0.014 °
−60 dBm	−0.3 °	_____	+0.3 °	±0.041 °
−70 dBm	−0.6 °	_____	+0.6 °	±0.143 °
−80 dBm	−1.8 °	_____	+1.8 °	±0.402 °
−90 dBm	−6.0 °	_____	+6.0 °	±1.262 °
−100 dBm	−18.0 °	_____	+18.0 °	±4.065 °

HP 8751A NETWORK ANALYZER
MAINTENANCE MANUAL

SERIAL NUMBERS

This manual applies directly to instruments with serial number prefix 3026J. For additional important information about serial numbers, read "Instruments Covered By Manual" in General Information of this Maintenance Manual.

HEWLETT PACKARD

HP Part No. 08751-90030
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Yokogawa-Hewlett-Packard, LTD.
YHP Instrument Operation
9-1, Takakura-cho, Hachioji-shi,
Tokyo, 192 Japan

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Manual Printing History

The manual printing date and part number indicate its current edition. The printing date changes when a new edition is printed. (Minor corrections and updates which are incorporated at reprint do not cause the date to change.) The manual part number changes when extensive technical changes are incorporated.

November 1990..... 1st. Edition

Safety Summary

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific *WARNINGS* given elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument.
The Hewlett-Packard Company assumes no liability for the customer's failure to comply with these requirements.

Ground The Instrument

This is a Safety Class 1 product (provided with a protective earthing terminal). An uninterruptible safety earth grand must be provided from the main power source to the product input wiring terminals, power source to the product input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, the product must be made inoperative and secured against any unintended operation.

DO NOT Operate In An Explosive Atmosphere

Do not operate the instrument in the presence of flammable gasses or fumes. Operation of any electrical instrument in such an environment constitutes a safety hazard.

Keep Away From Live Circuits

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with the power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

DO NOT Service Or Adjust Alone

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

DO NOT Substitute Parts Or Modify Instrument

Because of the danger of introducing additional hazards, do not substitute parts or perform unauthorized modifications to the instrument. Return the instrument to a Hewlett-Packard Sales and Service Office for service and repair to ensure the safety features are maintained.

Dangerous Procedure Warnings

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

Warning **Dangerous voltages, capable of causing death, are present in this instrument. Use extreme caution when handling, testing, and adjusting this instrument.**

How To Use This Manual

This is the Maintenance Manual for the HP 8751A Network Analyzer. This manual contains the performance test procedures. For more detailed information, refer to the Chapter 1. General Information.

Typeface Conventions

Bold	Boldface type is used when a term is defined. For example: **icons** are symbols.
Italics	Italic type is used for emphasis and for titles of manuals and other publications. Italic type is also used for keyboard entries when a name or a variable must be typed in place of the words in italics. For example: `copy` *filename* means to type the word `copy`, to type a space, and then to type the name of a file such as `file1`.
`Computer`	Computer font is used for on-screen prompts and messages.
HARDKEYS	Labeled keys on the instrument front panel are enclosed in ▢.
SOFTKEYS	Softkeys located to the right of the CRT are enclosed in ▒.

Certification

Hewlett-Packard Company certifies that this product met its published specifications at the time of shipment from the factory. Hewlett-Packard further certifies that its calibration measurements are traceable to the United States National Institute for Standards and Technology, to the extent allowed by the Institution's calibration facility, or to the calibration facilities of other International Standards Organization members.

Warranty

This Hewlett-Packard instrument product is warranted against defects in material and workmanship for a period of one year from the date of shipment, except that in the case of certain components listed in *General Information* of this manual, the warranty shall be for the specified period. During the warranty period, Hewlett-Packard Company will, at its option, either repair or replace products which prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by HP. Buyer shall prepay shipping charges to HP and HP shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to HP from another country.

HP warrants that its software and firmware designated by HP for use with an instrument will execute its programming instruction when property installed on that instrument. HP does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error free.

Limitation Of Warranty

The foregoing warranty shall not apply to defects resulting from improper or adequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environment specifications for the product, or improper site preparation or maintenance.

No other warranty is expressed or implied. HP specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

Exclusive Remedies

The remedies provided herein are buyer's sole and exclusive remedies. HP shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory.

Assistance

Product maintenance agreements and other customer assistance agreements are available for Hewlett-Packard products.

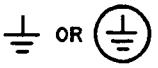
For any assistance, contact your nearest Hewlett-Packard Sales and Service Office. Address are provided at the back of this manual.

Safety Symbols

General definitions of safety symbols used on equipment or in manuals.

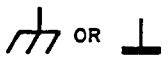
Instruction manual symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect against damage to the instrument.

Indicates dangerous voltage (terminals fed from the interior by voltage exceeding 1000 volts must be so marked).



Protective conductor terminal. For protection against electrical shock in case of a fault. Used with wiring terminals to indicate the terminal which must be connected to ground before operating equipment.

Low-noise or noiseless, clean ground (earth) terminal. Used for a signal common, as well as providing protection against electrical shock in case of fault. A terminal marked with this symbol must be connected to ground in the manner described in the installation (Operation) manual, and before operating the equipment.



Frame or chassis terminal. A connection to the frame (chassis) of the equipment which normally includes all exposed metal structures.

Alternating current (power line).

Direct current (power line).

Alternating or direct current (power line).

Warning

Warning denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death to personnel.

Caution

Caution sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result damage to or destruction of part or all of the product.

Note

Note denotes important information. It calls attention to a procedure, practice, condition or the like, which is essential to highlight.

Documentation Map

Operation Manual Set (HP Part Number 08751-90000)

User's Guide

The User's Guide walks you through system setup and initial power-on, shows how to make basic measurements, explains commonly used features, and tells you how to get the most performance from your analyzer. After you receive your HP 8751A, begin with this manual. (P/N 08751-90001)

General Information

The General Information provides general information, specifications.

Reference Manual

The Reference Manual provides in-depth reference information.

HP-IB Programming Manual

The HP-IB Programming Guide provides a summary of all available HP-IB command, and shows how to make basic program to control the HP 8751A by a controller via HP-IB.

Maintenance Manual (HP Part Number 08751-90030)

The Maintenance Manual explains how to verify conformance to published specifications.

Service Manual (Option 915), (HP Part Number 08751-90031)

The Service Manual explains how to adjust, troubleshoot, and repair the instrument.

Using HP Instrument BASIC with the HP 8751A (Option 002 only)

The Using HP Instrument BASIC with the HP 8751A describes how HP Instrument BASIC works with the HP 8751A and any unique features. This manual is furnished option 002.

HP Instrument BASIC Manual Set (Option 002 only), (HP Part Number E2083-90000)

HP Instrument BASIC User's Handbook

The HP Instrument BASIC User's Handbook provides some helpful hints on getting the most use from HP Instrument BASIC programming language, and provides a general programming reference. This manual is furnished option 002.

HP Instrument BASIC Language Reference

The HP Instrument BASIC Language Reference provides a summary of all available HP Instrument BASIC Language. This manual is furnished option 002.

Contents

1. **General Information**
   - INTRODUCTION . . . 1-1
   - MANUAL ORGANIZATION . . . 1-1
   - INSTRUMENTS COVERED BY THIS MANUAL . . . 1-1
   - RECOMMENDED TEST EQUIPMENT . . . 1-2
   - LINE FUSE REPLACEMENT PROCEDURE . . . 1-5

2. **Performance Tests**
   - INTRODUCTION . . . 2-1
   - PERFORMANCE TEST RECORD . . . 2-1
   - CALCULATION SHEET . . . 2-2
   - CALIBRATION CYCLE . . . 2-2
   - FREQUENCY RANGE AND ACCURACY TEST . . . 2-3
     - Specification . . . 2-3
     - Test Equipment . . . 2-3
     - Procedure . . . 2-3
   - HARMONICS TEST . . . 2-5
     - Specification . . . 2-5
     - Test Equipment . . . 2-5
     - Procedure . . . 2-5
   - NON-HARMONIC SPURIOUS TEST . . . 2-7
     - Specification . . . 2-7
     - Test Equipment . . . 2-7
     - Procedure . . . 2-7
   - PHASE NOISE TEST . . . 2-9
     - Specification . . . 2-9
     - Test Equipment . . . 2-9
     - Procedure . . . 2-9
   - SOURCE LEVEL ACCURACY/FLATNESS TEST . . . 2-11
     - Specification . . . 2-11
     - Test Equipment . . . 2-11
     - Procedure . . . 2-11
   - NON SWEEP POWER LINEARITY TEST . . . 2-14
     - Specification . . . 2-14
     - Test Equipment . . . 2-14
     - Procedure . . . 2-14
   - POWER SWEEP LINEARITY TEST . . . 2-16
     - Specification . . . 2-16
     - Test Equipment . . . 2-16
     - Procedure . . . 2-17
   - RECEIVER NOISE LEVEL TEST . . . 2-20
     - Specification . . . 2-20

Test Equipment . . . 2-20
Procedure . . . 2-21
TRACE NOISE TEST . . . 2-24
Specification . . . 2-24
Test Equipment . . . 2-24
Procedure . . . 2-24
RESIDUAL RESPONSE TEST . . . 2-26
Specification . . . 2-26
Test Equipment . . . 2-26
Procedure . . . 2-26
INPUT CROSSTALK TEST . . . 2-28
Specification . . . 2-28
Test Equipment . . . 2-28
Procedure . . . 2-28
INPUT IMPEDANCE TEST . . . 2-33
Specification . . . 2-33
Test Equipment . . . 2-33
Procedure . . . 2-33
ABSOLUTE AMPLITUDE ACCURACY TEST . . . 2-40
Specification . . . 2-40
Test Equipment . . . 2-40
Procedure . . . 2-41
MAGNITUDE RATIO/PHASE DYNAMIC ACCURACY TEST . . . 2-45
Specification . . . 2-45
Test Equipment . . . 2-45
Procedure . . . 2-46
MAGNITUDE RATIO FREQUENCY RESPONSE TEST . . . 2-61
Specification . . . 2-61
Test Equipment . . . 2-61
Procedure . . . 2-61
PHASE FREQUENCY RESPONSE TEST . . . 2-63
Specification . . . 2-63
Test Equipment . . . 2-63
Procedure . . . 2-63
DC MEASUREMENT RANGE AND ACCURACY TEST . . . 2-66
Specification . . . 2-66
Test Equipment . . . 2-66
Procedure . . . 2-66
CALCULATION SHEET . . . 2-68
Harmonics Test . . . 2-68
Non-Harmonic Sprious Test . . . 2-68
Phase Noise Test . . . 2-69
Source Level Linearity/Flatness Test . . . 2-69
Non Sweep Power Linearity Test . . . 2-70
HP 8482A Power Sensor . . . 2-70
HP 8481D Power Sensor . . . 2-70
Power Sweep Linearity Test . . . 2-71
CW FREQUENCY = 500 kHz . . . 2-71
CW FREQUENCY = 1 MHz . . . 2-72
CW FREQUENCY = 10 MHz . . . 2-73
CW FREQUENCY = 100 MHz . . . 2-74

CW FREQUENCY = 300 MHz 2-75
CW FREQUENCY = 500 MHz 2-76
Absolute Amplitude Accuracy Test 2-77
Input-R 2-77
Input-A 2-77
Input-B 2-78
Magnitude Ratio/Phase Dynamic Accuracy Test 2-79
Step Attenuator Calibration Value (at 50 MHz) 2-79
A/R Dynamic Accuracy (Mag. Ratio (50 MHz), Phase (3 MHz)) Test . . 2-79
B/R Dynamic Accuracy (Mag. Ratio (50 MHz), Phase (3 MHz)) Test . . 2-79
A/B Dynamic Accuracy (Mag. Ratio (50 MHz), Phase (3 MHz)) Test . . 2-80
A/R Dynamic Accuracy at the other frequencies Test 2-80
B/R Dynamic Accuracy at the other frequencies Test 2-81
A/B Dynamic Accuracy at the other frequencies Test 2-81
PERFORMANCE TEST RECORD 2-82
Frequency Range and Accuracy Test 2-82
without OPTION 001 2-82
with OPTION 001 2-82
Harmonics Test 2-83
Non-Harmonic Sprious Test 2-83
Phase Noise Test 2-83
Source Level Linearity/Flatness Test 2-84
Level Accuracy (at 50 MHz, 0 dBm) 2-84
Level Flatness (Relative to 0 dBm at 50 MHz) 2-84
Non Sweep Power Linearity Test 2-84
Power Sweep Linearity Test 2-85
CW FREQUENCY = 500 kHz 2-85
CW FREQUENCY = 1 MHz 2-86
CW FREQUENCY = 10 MHz 2-87
CW FREQUENCY = 100 MHz 2-88
CW FREQUENCY = 300 MHz 2-89
CW FREQUENCY = 500 MHz 2-90
Receiver Noise Level Test 2-91
IF BW = 2 Hz 2-91
IF BW = 20 Hz 2-91
IF BW = 200 Hz 2-91
IF BW = 1 kHz 2-92
IF BW = 4 kHz 2-92
Trace Noise Test 2-93
Residual Response Test 2-94
Input-R 2-94
Input-A 2-95
Input-B 2-95
Input Crosstalk Test 2-96
Input Impedance Test 2-96
Absolute Amplitude Accuracy Test 2-97
Input-R 2-97
Input-A 2-97
Input-B 2-98
Magnitude Ratio/Phase Dynamic Accuracy Test 2-99

A/R Dynamic Accuracy (Magnitude Ratio (50 MHz) and Phase (3 MHz)) Test . . . 2-99
Magnitude Ratio (50 MHz) . . . 2-99
Phase (3 MHz) . . . 2-99
B/R Dynamic Accuracy (Magnitude Ratio (50 MHz) and Phase (3 MHz)) Test . . . 2-100
Magnitude Ratio (50 MHz) . . . 2-100
Phase (3 MHz) . . . 2-100
A/B Dynamic Accuracy (Magnitude Ratio (50 MHz) and Phase (3 MHz)) Test . . . 2-101
Magnitude Ratio (50 MHz) . . . 2-101
Phase (3 MHz) . . . 2-101
A/R Dynamic Accuracy at the Other Frequencies Test . . . 2-102
B/R Dynamic Accuracy at the Other Frequencies Test . . . 2-102
A/B Dynamic Accuracy at the Other Frequencies Test . . . 2-103
Magnitude Ratio Frequency Response Test . . . 2-103
Phase Freqnecy Response Test . . . 2-104
DC Measurement Range and Accuracy Test . . . 2-104

A. Manual Changes
INTRODUCTION . . . A-1
MANUAL CHANGES . . . A-1

Figures

1-1. Serial Number Plate 1-2
1-2. Removing the Line Fuse Holder 1-5
2-1. Frequency Accuracy Test Setup 2-3
2-2. Harmonics Test Setup 2-5
2-3. Non Harmonics Spurious Test Setup 2-7
2-4. Phase Noise Test Setup 2-9
2-5. Level Accuracy/Flatness Test Setup 2-12
2-6. Power Linearity Test Setup 2-14
2-7. Power Sweep Linearity Test Setup 2-17
2-8. Power Sweep Linearity Test Setup 2-18
2-9. Receiver Noise Level Test Setup 2-21
2-10. Trace Noise Test Setup 2-24
2-11. Residual Response Test Setup 2-26
2-12. Crosstalk Test Setup 1 2-29
2-13. Crosstalk Test Setup 2 2-30
2-14. Crosstalk Test Setup 3 2-31
2-15. Input B Impedance Test Setup 2-33
2-16. Input A Impedance Setup 2-35
2-17. Input R Impedance Setup 2-37
2-18. Absolute Amplitude Accuracy Test Setup 1 2-41
2-19. Absolute Amplitude Accuracy Test Setup 2 2-42
2-20. Absolute Amplitude Accuracy Test Setup 3 2-43
2-21. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 1 2-47
2-22. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 2 2-49
2-23. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 3 2-50
2-24. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 4 2-51
2-25. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 5 2-53
2-26. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 6 2-54
2-27. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 7 2-56
2-28. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 8 2-59
2-29. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 9 2-60
2-30. Magnitude Ratio Frequency Response Test Setup 2-61
2-31. Phase Frequency Response Test Setup 2-63
2-32. DC Measurement Range and Accuracy Test Setup 2-66

Tables

1-1. Recommended Test Equipment (1/2) 1-3
A-1. Manual Changes by Serial Number A-1

1

General Information

INTRODUCTION

This manual contains technical information concerning the maintenance of the HP 8751A Network Analyzer.

MANUAL ORGANIZATION

This manual contains two chapters. A summary of each section follows.

Chapter 1. General Information

Chapter 1 describes this maintenance manual, and lists the test equipment required for the preventive maintenance and the performance tests. It also provides the procedures for replacing the line fuse.

Chapter 2. Performance Tests

Chapter 2 provides the performance test procedures for the incoming inspection and periodical maintenance.

INSTRUMENTS COVERED BY THIS MANUAL

Hewlett-Packard uses a two-part, nine character serial number which is stamped on the serial number plate (see Figure 1-1) attached to the rear panel. The first four digits and the letter are the serial prefix and the last five digits are the suffix. The letter placed between the two sections identifies the country where the instrument was manufactured. The prefix is the same for all identical instruments; it changes only when a change is made to the test set. The suffix, however, is assigned sequentially and is unique to each instrument. The contents of this manual apply to instruments with the serial number prefixes listed under Serial Numbers on the title page.

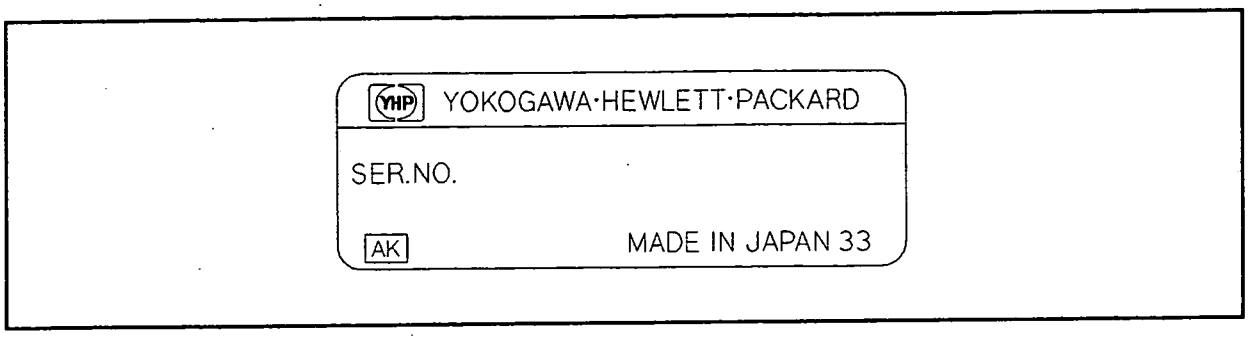


Figure 1-1. Serial Number Plate

An instrument manufactured after the printing date of this manual may have a serial number prefix that is not listed on the title page. This unlisted serial number prefix indicates that the instrument is different from those described in this manual. The manual for a new instrument may be accompanied by a yellow *MANUAL CHANGES* supplement or have a different manual part number. The *MANUAL CHANGES* supplement contains "change information" that explains how to adapt the manual to newer instruments.

In additions to change information, the supplement may contain information for correcting errors (Errata) in the manual. To keep this manual as current and accurate as possible, Hewlett-Packard recommends that you periodically request the latest *MANUAL CHANGES* supplement. The supplement for this manual is identified by this manual's printing data and its supplement are available from Hewlett-Packard. If the serial prefix or number of an instrument is lower than that on the title page of this manual, see APPENDIX A, MANUAL CHANGES.

For information concerning serial number prefixes not listed on the title page or in the *MANUAL CHANGE* supplement, contact the nearest Hewlett-Packard office.

RECOMMENDED TEST EQUIPMENT

Table 1-1 lists the equipment required for performance testing, adjustments, and troubleshooting the HP 8751A. Other equipment may be substituted if it meets or exceeds the critical specifications given in Table 1-1.

Table 1-1. Recommended Test Equipment (1/2)

Equipment	Critical Specifications	Recommended Model	Qty	Use[1]
Series 200/300 Controller	No substitute (BASIC Rev. 5.0 and above)	Model 310	1	A, T
Spectrum Analyzer	Frequency: 100 Hz to 1.5 GHz	HP 8566B or HP 8568B	1	P, A, T
Multimeter	No substitute	HP 3458A	1	P, A, T
Universal Source	DC Output: 0 to ±2 V, Accuracy: < 0.1%	HP 3245A	1	P, A
Frequency Counter	Frequency: 10 Hz to 500 MHz Accuracy: < 0.25 ppm	HP 5334B Opt. 010, 030	1	P, A
Power Meter	No substitute	HP 436A Opt.022, HP 437B, or HP 438A	1	P, A
Power Sensor	Frequency: 100 kHz to 500 MHz Power: +5 dBm to -20 dBm	HP 8482A	1	P, A
	Frequency: 10 MHz to 500 MHz Power: -20 to -60 dBm	HP 8481D	1	P
80 dB Step Attenuator	No substitute	HP 8496A/G with Opt.001 & H60[2]	1	P
Attenuator/ Switch Driver	No substitute	HP 11713A	1	P
Type-N Calibration Kit	No substitute	HP 85032B	1	P
Coaxial Loads	Type-N 50 Ω Termination	HP909C Opt.012	3	P, A, T
	50 Ω Feedthrough, BNC(m)-BNC(f)	PN 04192-61002 or HP 11048C	1	P, A
Program	Adjustments Program (3.5 in)	PN 08751-65002	1	A
Attenuator Pad	Impedance 50 Ω, N(m)-N(f)			
	ATT 6 dB	HP 8491A Opt. 006	1	P
	ATT 10 dB	HP 8491A Opt. 010	2	P
	ATT 6 dB, VSWR < 1.015	HP 8491A Opt. 006 & H60[3]	1	P
	ATT 10 dB, VSWR < 1.015	HP 8491A Opt. 010 & H60[4]	1	P
	ATT 20 dB	HP 8491A Opt. 020[5]	1	P, A, T

1 P: Performance Tests, A: Adjustments and Correction Constants, T: Troubleshooting

2 An HP 8496A/B step attenuator with required low VSWR (1.02) can be purchased by specifying option H60, then contact your nearest Hewlett-Packard service center for the required calibration frequency and calibration uncertainty.

3 An HP 8491A Opt. 006 fixed attenuator with required low VSWR (< 1.015) can be purchased by specifying Opt. H60.

4 An HP 8491A Opt. 010 fixed attenuator with required low VSWR (< 1.015) can be purchased by specifying Opt. H60.

5 An HP 8491A Opt. 020 must be calibrated at 1 MHz, 30 MHz, 50 MHz, 100 MHz, 300 MHz, and 500 MHz (Uncertainty: ≤ 0.06 dB). When you purchase an HP 8491A Opt. 020, contact your nearest Hewlett-Packard service center for the required calibration frequency and uncertainty.

Table 1-1. Recommended Test Equipment (1/2) (continued)

Equipment	Critical Specifications	Recommended Model	Qty	Use[1]
Cables	RF Cable Set	HP 11851B	1	P
	50 Ω N(m)-N(m), 61cm	HP 11500B	3	P, A, T
	50 Ω BNC(m)-BNC(m), 61 cm	PN 8120-1839	2	P, A
	50 Ω BNC(m)-BNC(m), 122 cm	PN 8120-1840	2	P, A
	50 Ω BNC(m)-SMB(f), 122 cm	PN 85680-60093	1	A, T
	50 Ω SMC(f)-SMC(f)	PN 08751-65006	1	T
	50 Ω SMC(m)-SMC(f)	PN 08751-65007	1	T
	HP-IB Cable	HP 10833A/B/C	3	A, T
Adapters	50 Ω, N(f)-N(f)	PN 1250-0777	2	P, A
	50 Ω, N(f)-BNC(f)	PN 1250-1474	1	A
	50 Ω, N(m)-N(m)	PN 1250-0778	1	P, A
	50 Ω, N(m)-BNC(f)	PN 1250-0780	2	P, A, T
	50 Ω, N(f)-BNC(m)	PN 1250-0077	1	A
	50 Ω SMC(m)-BNC(f)	PN 1250-1899	1	A, T
	50 Ω SMC(m)-N(m)	PN 1250-1023	1	A, T
	BNC (f)-Dual Banana Plug	PN 1251-2277	1	P, A
Power Splitter	Freq.Range: > 500 MHz, Two-way	HP 11667A	1	P, A, T
	Freq.Range: > 500 MHz, Three-way	HP 11850C	1	P, A, T
T/R Test Kit	Frequency: 5 Hz to 500 MHz Directivity: ≥ 40 dB	HP 87512A	1	P
Extender Board	HP 8751A Extender Board Set	PN 08751-65005	1	A, T
Tool	Board Extractor	PN 08751-65012	1	T

LINE FUSE REPLACEMENT PROCEDURE

If the line fuse of your HP 8751A is blown, perform the following procedures.

1. Turn the instrument up side down.
2. Use a small flat-bladed screwdriver to pry out the fuse holder as shown in Figure 1-2.

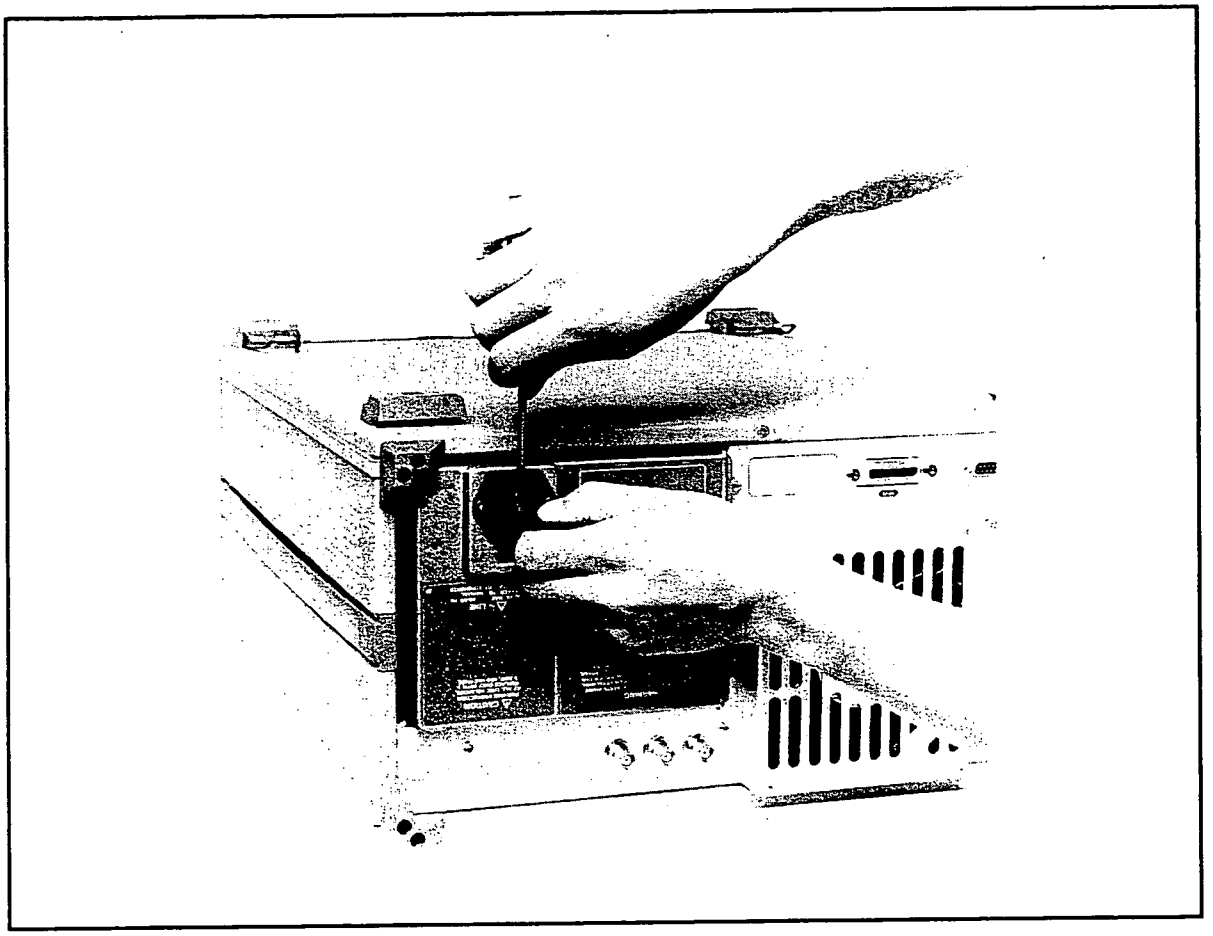


Figure 1-2. Removing the Line Fuse Holder

3. There is one spare fuse (PN 2110-0780: 3 A, 250 V) in the line fuse holder. Replace the blown fuse with a new fuse.
4. Reinstall the line fuse holder.

2

Performance Tests

INTRODUCTION

This chapter provides the test procedures used to verify that the HP 8751A's specifications listed in the HP 8751A Operating Manual are met. All tests can be performed without access to the interior of the instrument. The performance tests can also be used to perform incoming inspection, and to verify that the HP 8751A meets performance specifications after troubleshooting or adjustment. If the performance tests indicate that the HP 8751A is NOT operating within the specified limits, check your test setup, and then proceed to Adjustments or Troubleshooting in the HP 8751A service manual are required.

Note Allow the HP 8751A to warm up for at least 30 minutes before you execute any of the performance tests.

Note Perform all performance tests in an ambient temperature of 23 ° C ± 5 ° C.

PERFORMANCE TEST RECORD

Record the performance test results in the Test Record at the end of this chapter (Photocopy the Test Record and use the photocopy). The Test Record lists all test specifications, their acceptable limits, and measurement uncertainty for the recommended test equipment. Test results recorded during incoming inspection can be used for comparison purposes during periodic maintenance, troubleshooting, and after repair or adjustment.

CALCULATION SHEET

The Calculation Sheet is used to as an aid for recording raw measurement data, and calculating the performance test results.

The performance test procedure gives the test sequence for performing a test, the complete set of measurement data are recorded on the calculation sheet, the results are calculated using the equations given on the calculation sheet, and the results are transcribed to the Performance Test Record.

The procedure for using the calculation sheet is:

1. Photo copy the Calculation Sheet.
2. Follow the performance test procedure and record the measurement value, the HP 8751A's reading, etc., into the specified column on the Calculation Sheet.
3. Calculate the test result using the appropriate equation given on the Calculation Sheet.
4. Record the test result into the TEST RESULT column on the Calculation Sheet of the Performance Test Record sheet as appropriate.

CALIBRATION CYCLE

The HP 8751A requires periodic performance verification. The frequency of performance verification depends on the operating and environmental conditions under which the HP 8751A is used. Verify the HP 8751A's performance at least once a year, using the performance tests described in this chapter.

FREQUENCY RANGE AND ACCURACY TEST

This test uses an external frequency counter to test the HP 8751A's Internal Synthesizer Frequency Accuracy over its entire frequency range.

Specification

Frequency Range:	5 Hz to 500 MHz
Frequency Accuracy:	± (20 ppm + 1 mHz), at 23 °C ± 5 °C (Standard) ± (1.0 ppm + 1 mHz), at 0 to 55 °C, 20 minutes after power on (With Opt. 001)

Test Equipment

Frequency Counter	HP 5334B Opt.010, 030
BNC(m)-BNC(m) Cable, 61 cm	PN 8120-1839
N(m)-BNC(f) Adapter	PN 1250-1476

Procedure

1. Connect the BNC(m)-BNC(m) Cable from HP 8751A RF OUT to the Frequency Counter INPUT A as shown in Figure 2-1.

   If the HP 8751A is equipped with Option 001, confirm that a BNC(m)-BNC(m) cable is connected between the EXT REF INPUT (10/N MHz) connector and the REF OVEN (OPTION 001) connector on the rear panel. If Option 001 is NOT installed, connect nothing to the EXT REF INPUT (10/N MHz) connector.

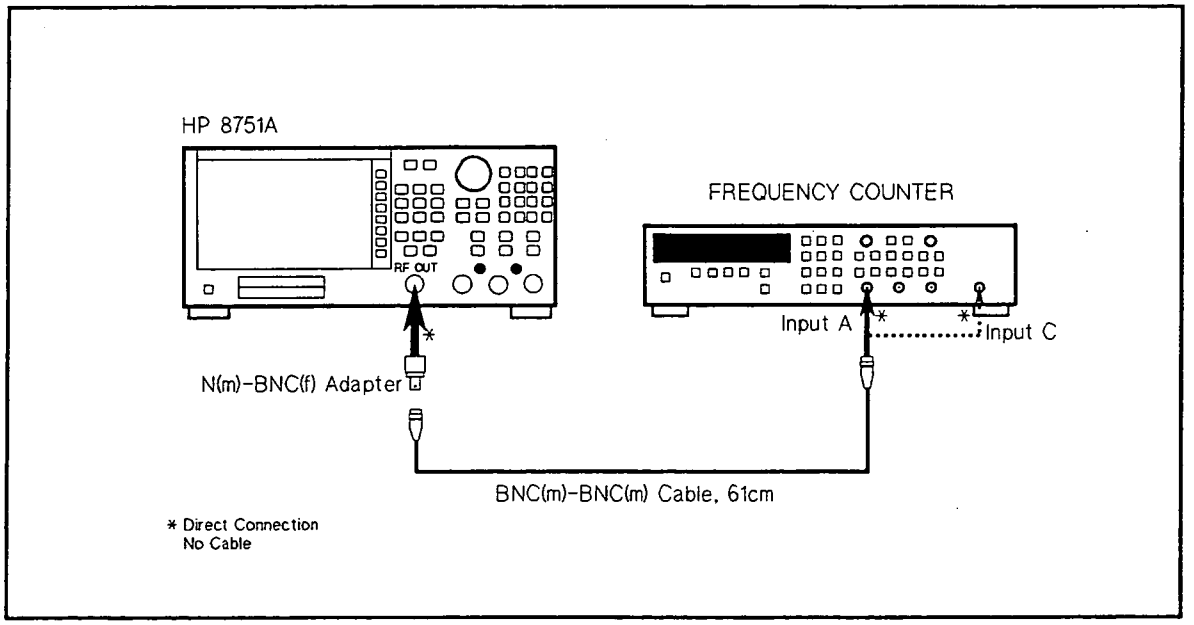


Figure 2-1. Frequency Accuracy Test Setup

2. Set up the HP 8751A as follows.

Control Settings	Key Strokes
PRESET	[PRESET]
START Freq. = 6.387499999 Hz	[START], [6], [.], [3], [8], [7], [4], [9], [9], [9], [9], [9], [M/u]
STOP Freq. = 17.387499999 MHz	[STOP], [1], [7], [.], [3], [8], [4], [9], [9], [9], [9], [9], [M/u]
Number of Points: 2	[MENU], NUMBER of POINTS, [2], [x1]
Trigger: Manual Trigger on Point	[MENU], TRIGGER MENU, MANUAL TRG ON POINT

3. Set the frequency by pressing the MANUAL TRG ON POINT softkey in accordance with the following table. Record the frequency counter reading on the Performance Test Record.

HP 8751A Frequency
6.387499999 MHz
17.387499999 MHz

4. Press TRIGGER: TRIG OFF.
5. Set the gate time of the frequency counter to 10 s.
6. Change the HP 8751A control settings as follows:

Control Settings	Key Strokes
CENTER Freq. = 5 Hz	[CENTER], [5], [x1]
SPAN Freq. = 0 Hz	[SPAN], [0], [x1]

7. Record the frequency counter reading on the Performance Test Record.
8. Change the gate time of the frequency counter to 300 ms.
9. Press [CENTER], [8], [3], [.], [0], [6], [9], [M/u] to set the CENTER FREQUENCY to 83.069 MHz.
10. Record the frequency counter reading on the Performance Test Record.
11. Remove the cable from the frequency counter INPUT A, and connect the cable to the frequency counter INPUT C.
12. Set the HP 8751A CENTER FREQUENCY according to the table listed below. Record the frequency counter reading on the Performance Test Record.

HP 8751A CENTER FREQUENCY
250 MHz
500 MHz

HARMONICS TEST

This test measures the HP 8751A signal source's second harmonics and third harmonics with a spectrum analyzer.

Specification

Harmonics:	< -30 dBc (at +10 dBm output level)

Test Equipment

Spectrum Analyzer	HP 8566B
N(m)-BNC(f) Adapter	PN 1250-1476, 2 ea.
BNC(m)-BNC(m) Cable, 122 cm	PN 8120-1840, 2 ea.

Procedure

1. Set up the test configuration shown in Figure 2-2.

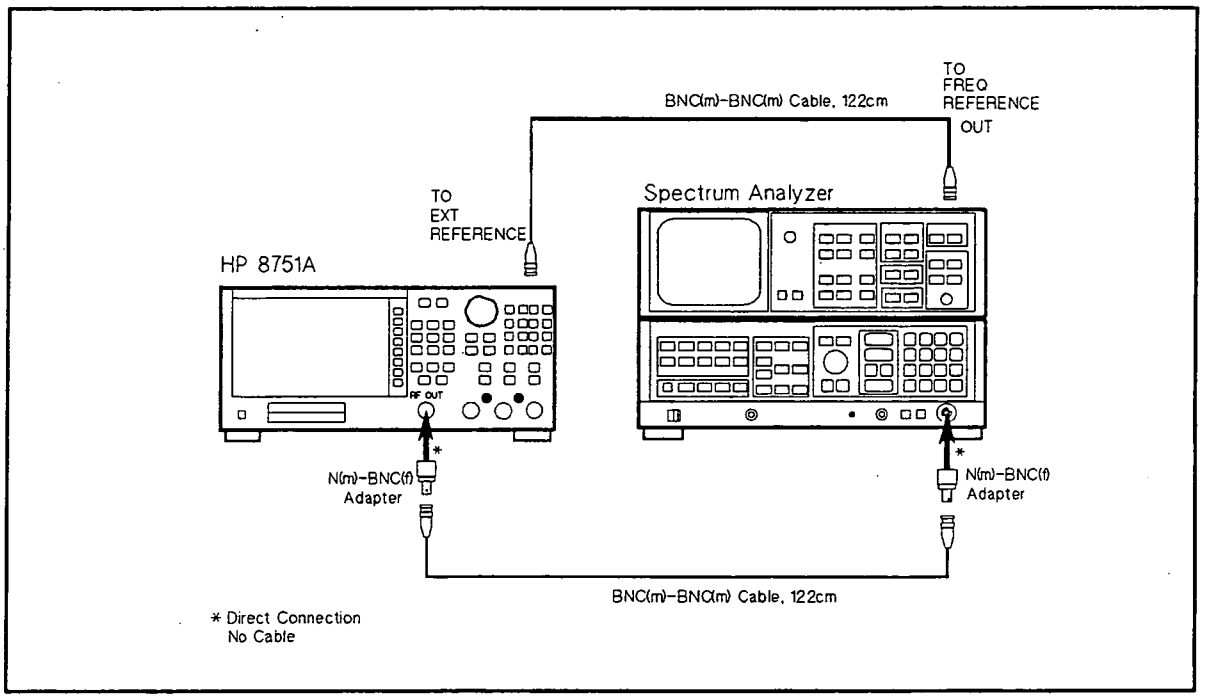


Figure 2-2. Harmonics Test Setup

2. Set up the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
Source Power = 10 dBm	[MENU], [POWER], [1], [0], [x1]
Span = 0 Hz	[SPAN], [0], [x1]

3. Set the spectrum analyzer as follows:

Reference Level	+20 dBm
Res BW	AUTO

4. Set the HP 8751A's center frequency and the spectrum analyzer's center and span frequency according to the table below. Then record the spectrum analyzer readings in the calculation sheet.

HP 8751A Center Freq.	Spectrum Analyzer	
	CENTER	SPAN
100 Hz	100 Hz	100 Hz
	200 Hz	100 Hz
	300 Hz	100 Hz
10 kHz	10 kHz	5 kHz
	20 kHz	5 kHz
	30 kHz	5 kHz
500 kHz	500 kHz	5 kHz
	1.0 MHz	5 kHz
	1.5 MHz	5 kHz
10 MHz	10 MHz	5 kHz
	20 MHz	5 kHz
	30 MHz	5 kHz
100 MHz	100 MHz	5 kHz
	200 MHz	5 kHz
	300 MHz	5 kHz
300 MHz	300 MHz	5 kHz
	600 MHz	5 kHz
	900 MHz	5 kHz
500 MHz	500 MHz	5 kHz
	1 GHz	5 kHz
	1.5 GHz	5 kHz

5. Use the equation given on the calculation sheet to calculate the test results, and transcribe the test results to the Performance Test Record.

NON-HARMONIC SPURIOUS TEST

This test uses a spectrum analyzer to measure the HP 8751A's signal source Non-Harmonic Spurious signal which appears near the carrier frequency.

Specification

Non Harmonic Spurious: < -45 dBc (at 0 dBm output level)

Test Equipment

Spectrum Analyzer	HP 8566B
N(m)-BNC (f) Adapter	PN 1250-1476, 2 ea.
BNC(m)-BNC(m) Cable, 122 cm	PN 8120-1840, 2 ea.

Procedure

1. Set up the test configuration as shown in Figure 2-3.

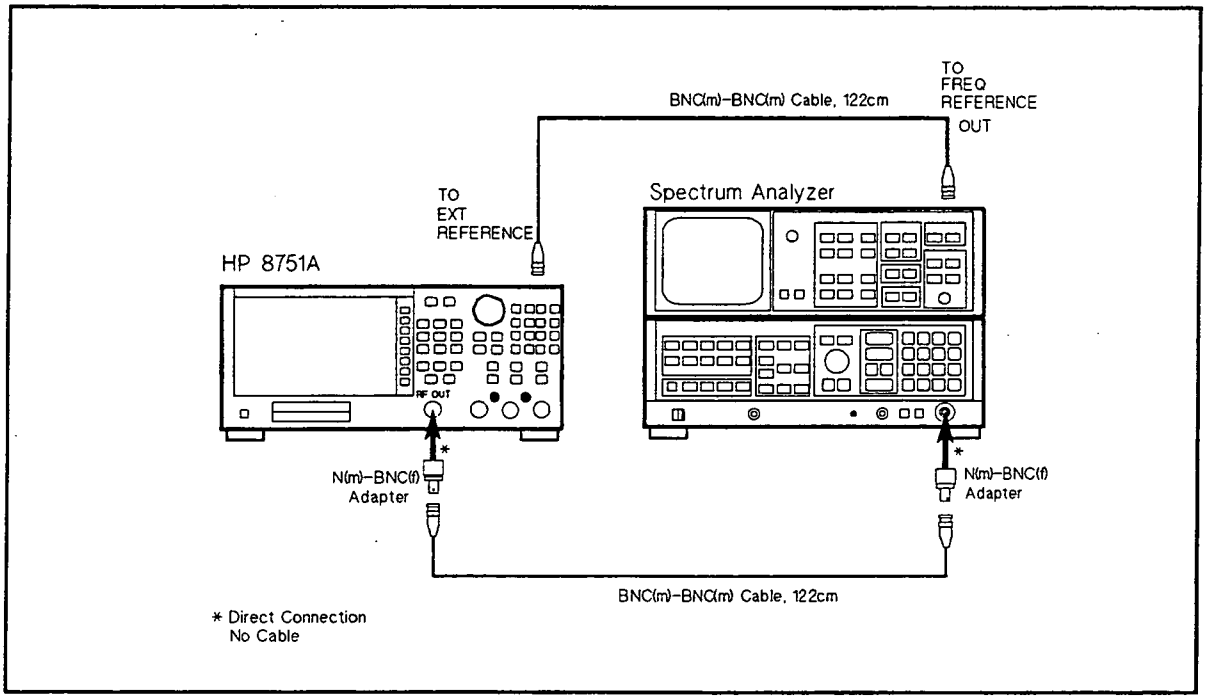


Figure 2-3. Non Harmonics Spurious Test Setup

2. Set up the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
Span = 0 Hz	[SPAN], [0], [x1]

3. Perform the following sequence.
   a. Set the HP 8751A's CENTER FREQUENCY and the Spectrum Analyzer's CENTER, SPAN, RBW according to the table.
   b. Move the Spectrum Analyzer's marker to the peak value (Fundamental) using the peak search function.
   c. Record the fundamental frequency and amplitude on the calculation sheet.
   d. Calculate the spectrum analyzer CENTER frequency for the sprious measurement according to the calculation sheet, if necessary.
   e. Set the spectrum analyzer CENTER, SPAN, and RBW according to the table.
   f. Move the Spectrum Analyzer's marker to the peak value (Sprious Max.) using the peak search function.
   g. Record the Spectrum Analyzer reading on the Calculation Sheet.
   h. Repeat steps a through g until all frequencies in the table are completed.

HP 8751A Center Freq.	Spectrum Analyzer			
	CENTER	SPAN	RBW	Marker
493.7625 MHz	493.7625 MHz	20 kHz	300 Hz	Fundamental (f1)
	(f1) + 225 Hz	400 Hz	10 Hz	Sprious Max.
493.76274125 MHz	493.76274125 MHz	20 kHz	300 Hz	Fundamental (f2)
	(f2) + 550 Hz	1 kHz	10 Hz	Sprious Max.
493.7649125 MHz	493.7649125 MHz	20 kHz	300 Hz	Fundamental (f3)
	(f3) + 5.5 kHz	10 kHz	100 Hz	Sprious Max.
493.786625 MHz	493.786625 MHz	100 kHz	300 Hz	Fundamental (f4)
	(f4) + 55 kHz	100 kHz	300 Hz	Sprious Max.
426 MHz	426 MHz	20 kHz	300 Hz	Fundamental
	424 MHz	20 kHz	300 Hz	Sprious Max.

4. Use the equation given on the Calculation Sheet to calculate the test results, and record the test results in the Performance Test Record.

PHASE NOISE TEST

This test measures the HP 8751A's signal source Phase Noise. A spectrum analyzer is used to determine the phase noise which broadens the carrier spectrum.

Specification

Phase Noise: < -75 dBc/Hz (at 20 kHz offset from 0 dBm fundamental)

Test Equipment

Spectrum Analyzer	HP 8566B
N(m)-N(f) Adapter	PN 1250-1476, 2 ea.
BNC(m)-BNC(m) Cable, 122 cm	PN 8120-1840, 2 ea.

Procedure

1. Set up the test configuration as shown in Figure 2-4.

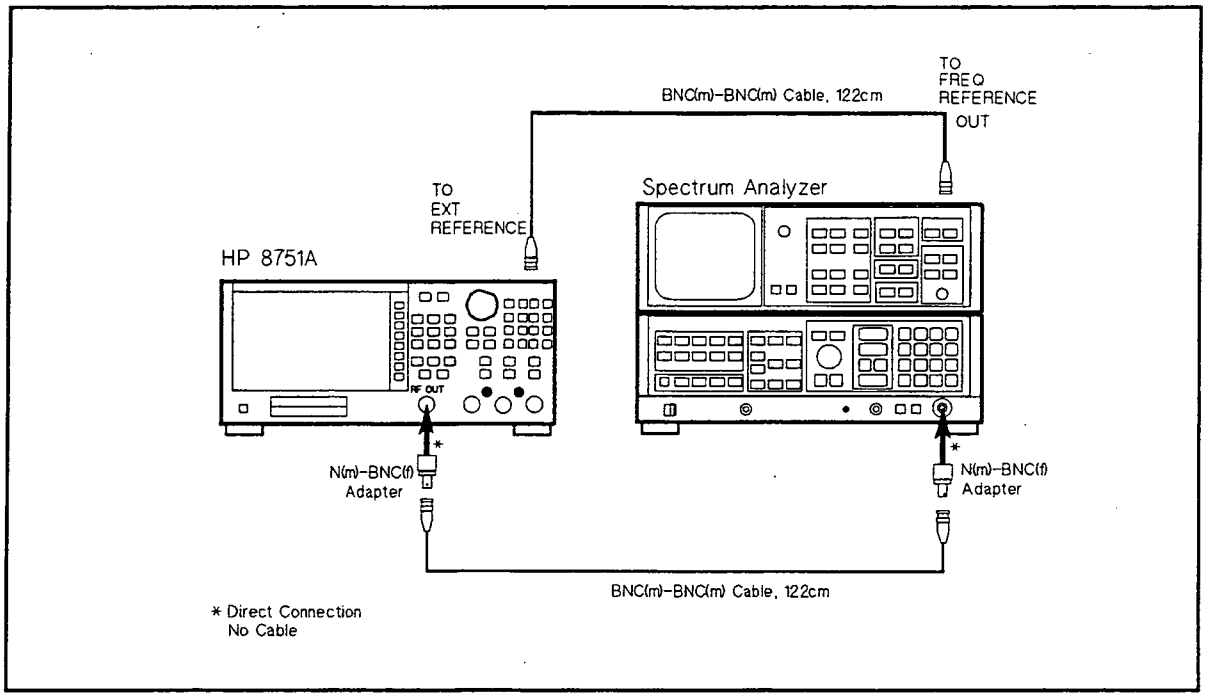


Figure 2-4. Phase Noise Test Setup

2. Set up the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
SPAN Freq. = 0 Hz	[SPAN], [0], [x1]

3. Set the spectrum analyzer as follows:

Frequency Span	50 kHz
RES BW	100 Hz

4. Set the HP 8751A CENTER FREQUENCY, and the spectrum analyzer CENTER FREQUENCY, according to the following table. Then record the spectrum analyzer reading at CENTER FREQUENCY into Calculation Sheet, and record the spectrum analyzer reading at the ± 20 kHz frequency points of the CENTER FREQUENCY into Calculation Sheet.

CENTER FREQUENCY For HP 8751A and Spectrum Analyzer
4 MHz
249 MHz
498.5875 MHz

5. Use the equation given on the Calculation Sheet to calculate the test results, and record the test results in the Performance Test Record.

SOURCE LEVEL ACCURACY/FLATNESS TEST

This test measures the HP 8751A's signal source output Level Accuracy/Flatness. A digital voltmeter or a power meter is used to measure each output port level at several frequencies. The Flatness test is checked by the tolerance of the level at 50 MHz.

Specification

Level Accuracy:	± 0.5 dB (at 23 ± 5°C, 0 dBm output level, 50 MHz)
Level Flatness:	(at 23 ± 5°C, Relative to 0 dBm output level at 50 MHz)
5 Hz ≤ Freq. ≤ 1 MHz	±2.0 dB
1 MHz < Freq. ≤ 300 MHz	±1.5 dB
300 MHz < Freq. ≤ 500 MHz	±2.0 dB

Test Equipment

Digital Voltmeter	HP 3458A
Power Meter	HP 436A
Power Sensor	HP 8482A
50 Ω Feedthrough	PN 04192-61002
BNC(m)-BNC(m) Cable, 61 cm	PN 8120-1839
N(m)-BNC(f) Adapter	PN 1250-1476
BNC(f)-Dual Banana Plug Adapter	PN 1251-2277

Procedure

1. Connect the Power Sensor to the Power Meter, and calibrate the Power Meter for the Power Sensor.

2. Connect the Power Sensor to the HP 8751A RF OUT as shown in Figure 2-5.

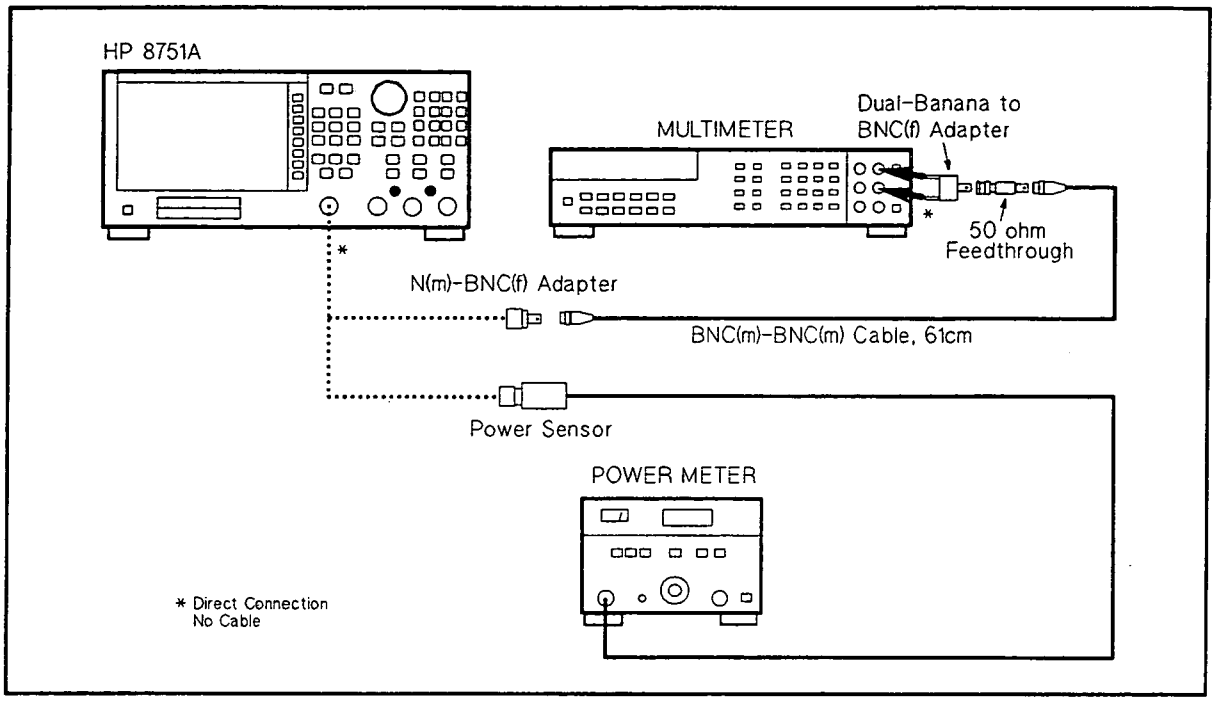


Figure 2-5. Level Accuracy/Flatness Test Setup

3. Set up the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
CENTER Freq.= 50 MHz	[CENTER], [5], [0], [M/u]
SPAN = 0 Hz	[SPAN], [0], [x1]
Source Power = 0 dBm	[MENU], [POWER], [0], [x1]

4. Record the Power Meter reading on the performance test record, and transcribe it into Calculation Sheet.

5. Set the HP 8751A CENTER FREQUENCY as follows, and record the Power Meter reading into Calculation Sheet.

HP 8751A CENTER FREQUENCY
1 MHz
10 MHz
100 MHz
300 MHz
500 MHz

6. Disconnect the power sensor, and connect the Digital Voltmeter INPUT to HP 8751A RF OUT, as shown in Figure 2-5 (use a 50 Ω Feedthrough on the Digital Voltmeter input).

7. Set the Multimeter as follows:

Measurement Function:	AC Volts mode
Display Reading Value:	dBm reading value
Measurement Method:	Synchronous Sampling Conversion

8. Set the HP 8751A CENTER FREQUENCY as follows, and Record the Digital Voltmeter reading in the Calculation Sheet for each setting.

HP 8751A CENTER FREQUENCY
5 Hz
50 Hz
1 kHz
10 kHz
100 kHz

9. Use the equation given on the Calculation sheet to calculate the test results (Flatness), and transcribe the test results to the FLATNESS column in the Performance Test Record.

NON SWEEP POWER LINEARITY TEST

This tests the HP 8751A's signal source non sweep power linearity. The linearity is measured by the Power Meter.

Specification

Output Level Linearity	± 0.5 dB, Output Level ≥ -35 dBm, 23 °C ± 5 °C, 50 MHz, Relative to 0 dBm ± 1.5 dB, Output Level < -35 dBm, 23 °C ± 5 °C, 50 MHz, Relative to 0 dBm

Test Equipment

Power Meter	HP 436A
Power Sensor	HP 8482A
Power Sensor	HP 8481D
10 dB Attenuator Pad	HP 8491A Opt.010

Procedure

1. Connect the HP 8482A Power Sensor to the Power Meter, and calibrate the Power Meter for the Power Sensor.
2. Connect the Power Meter to the HP 8751A's RF OUT as shown in Figure 2-6.

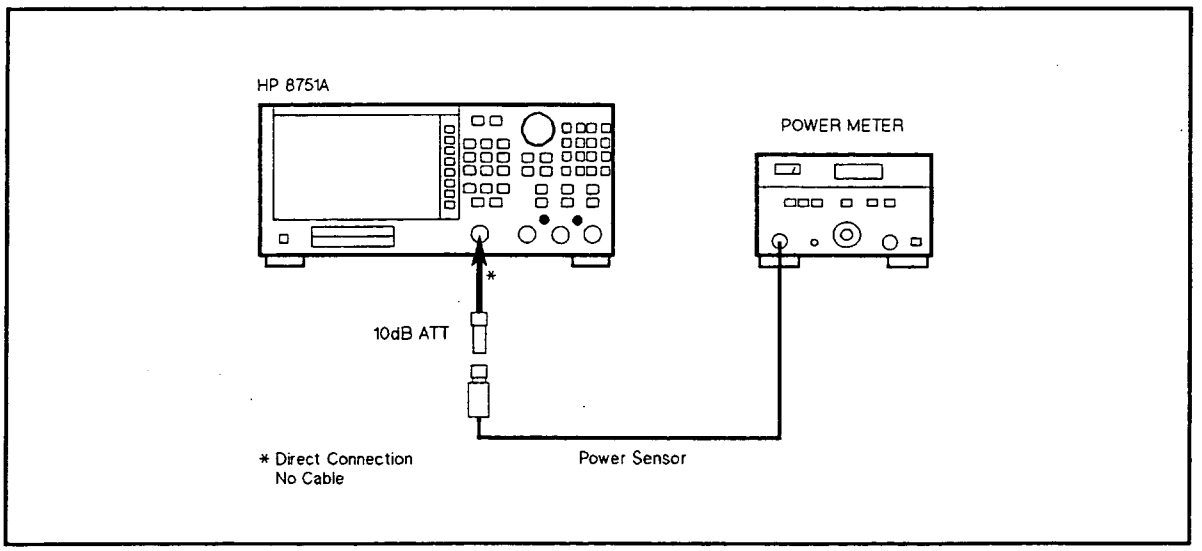


Figure 2-6. Power Linearity Test Setup

3. Set up the HP 8751A as follows.

Control Settings	Key Strokes
PRESET	[PRESET]
CENTER Freq. = 50 MHz	[CENTER], [5], [0], [M/u]
SPAN Freq. = 0 Hz	[SPAN], [0], [x1]

4. Record the Power Meter's reading value on the Calculation Sheet.
5. Set the HP 8751A SOURCE POWER as follows, and record the Power Meter's reading value into Calculation Sheet.

SOURCE POWER
+15 dBm
+10 dBm
+0 dBm
-10 dBm

6. Remove the HP 8482A Power Sensor from the HP 8751A RF OUT connector.
7. Change the Power Sensor from the HP 8482A to the HP 8481D, and calibrate the Power Meter for the Power Sensor.
8. Connect the Power Sensor to the HP 8751A RF OUT.
9. Set the SOURCE POWER according to the following table, and record the Power Meter's reading value into the Calculation Sheet.

SOURCE POWER
-10 dBm
-15 dBm
-20 dBm
-25 dBm
-30 dBm
-35 dBm
-40 dBm
-50 dBm

10. Use the equation given on the Calculation Sheet to calculate the test results, and transcribe the test results to the Performance Test Record.

POWER SWEEP LINEARITY TEST

This test checks the HP 8751A's signal source linearity (Power Sweep).

Specification

Start Power $\geq$ −45 dBm, relative to the STOP power level

	Span $\leq$ +20 dB	Span > +20 dB
CW Freq. $\leq$ 300 MHz	±(0.3 dB/10dB + 0.2dB)	±(0.3 dB/10dB + 1.0 dB)
CW Freq. > 300 MHz	±(1.0 dB/10dB + 0.2 dB)	±(1.0 dB/10dB + 1.0 dB)

Start Power < −45 dBm, relative to the STOP power level

	Span $\leq$ +20 dB	Span > +20 dB
CW Freq. $\leq$ 300 MHz	±(0.3 dB/10dB + 1.2dB)	±(0.3 dB/10dB + 2.0 dB)
CW Freq. > 300 MHz	±(1.0 dB/10dB + 1.2 dB)	±(1.0 dB/10dB + 2.0 dB)

Test Equipment

Power Meter	HP 436A
Power Sensor	HP 8481D
10 dB Attenuator Pad	HP 8491A Opt.010
Mulitmeter	HP 3458A
50 Ω Feedthrough	PN 04192-61002
BNC(m)-BNC(m) Cable, 61 cm	PN 8120-1839
BND(f)-Dual Banana Plug Adapter	PN 1251-2277

Procedure

1. Connect the Multimeter as shown in Figure 2-7.

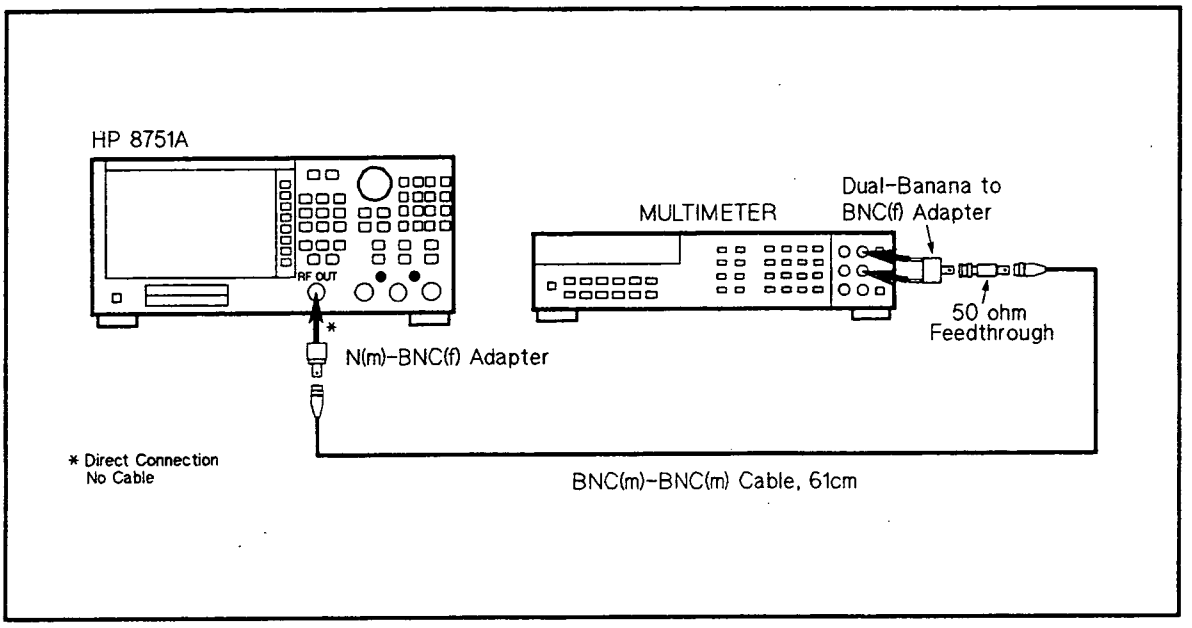


Figure 2-7. Power Sweep Linearity Test Setup

2. Set up the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
Sweep Type: Power	[MENU], SWEEP TYPE MENU, POWER SWEEP
START Power = -50 dBm	[START], [-], [5], [0], [x1]
STOP Power = -15 dBm	[STOP], [-], [1], [5], [x1]
CW Freq. = 500 kHz	[MENU], CW FREQ, [5], [0], [0], [k/m]
Number of Points: 8	[MENU], NUMBER of POINTS, [8], [x1]
Trigger: Manual Trigger on Point	[MENU], TRIGGER MENU, MANUAL TRG ON POINT

3. Set the Multimeter as follows:

Measurement Function:	AC Volts mode
Display Reading Value:	dBm reading value
Measurement Method:	Synchronous Sampling Conversion
Measurement Range:	100 mV Range

4. Set the power by pressing MANUAL TRG ON POINT in accordance with the following table. Record the meter reading on the Calculation Sheet.

Power Level (dBm)
-50 dBm
-45 dBm
-40 dBm
-35 dBm
-30 dBm
-25 dBm
-20 dBm
-15 dBm

5. Press (MENU), CW FREQ, (1), (M/u) to change the CW frequency to 1 MHz.
6. Repeat step 4.
7. Connect the Power Sensor to the Power Meter, and calibrate the Power Meter for the Power Sensor.
8. Connect the equipment as shown in Figure 2-8.

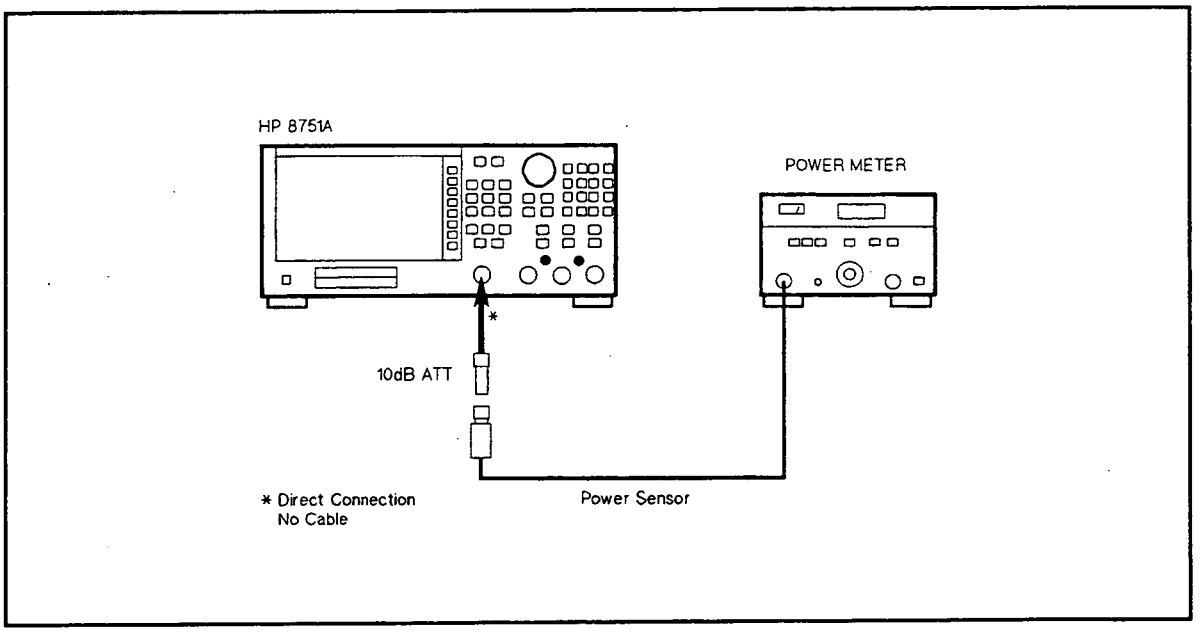


Figure 2-8. Power Sweep Linearity Test Setup

9. Set the CW Frequency in accordance with the following table, and repeat step 4 for each CW Frequency.

CW Frequency
10 MHz
100 MHz
300 MHz
500 MHz

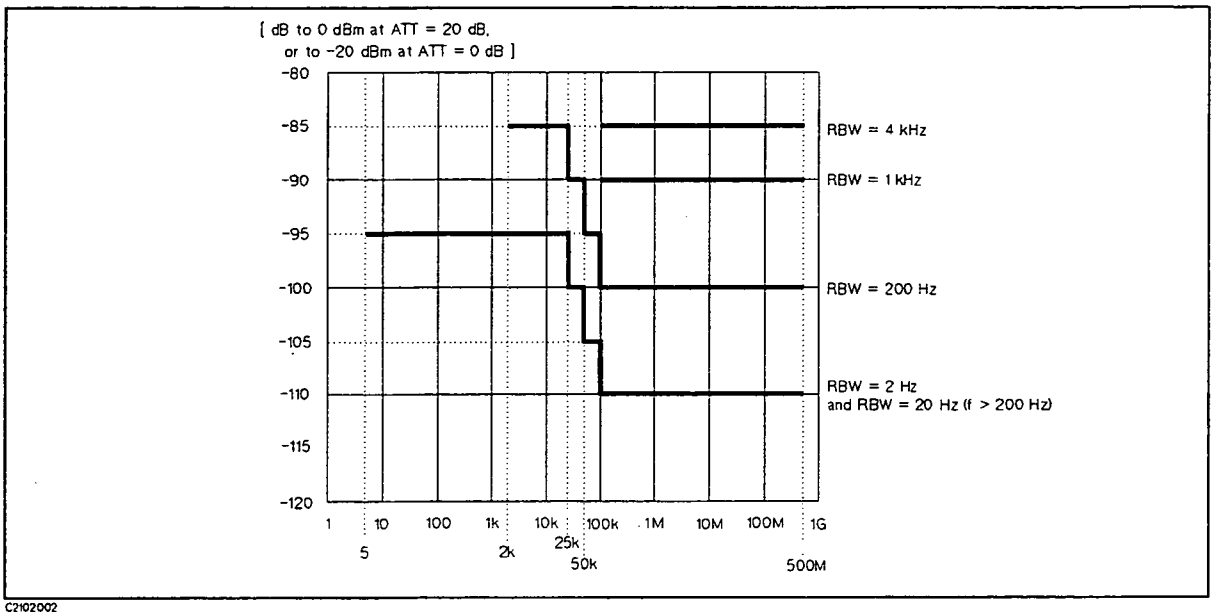
10. Use the equation given on the calculation sheet to calculate the test results, and transcribe the test results to the Performance Test Record.

RECEIVER NOISE LEVEL TEST

This test measures the HP 8751A's Receiver Noise Level (Noise Floor). Linear format is used to avoid skewing the data with the marker statistics function.

Specification

At 23 ± 5°C,



Test Equipment

50 Ω Termination	HP 909C, 3 ea.

Procedure

1. Connect each 50 Ω Termination to each input as shown in Figure 2-9.

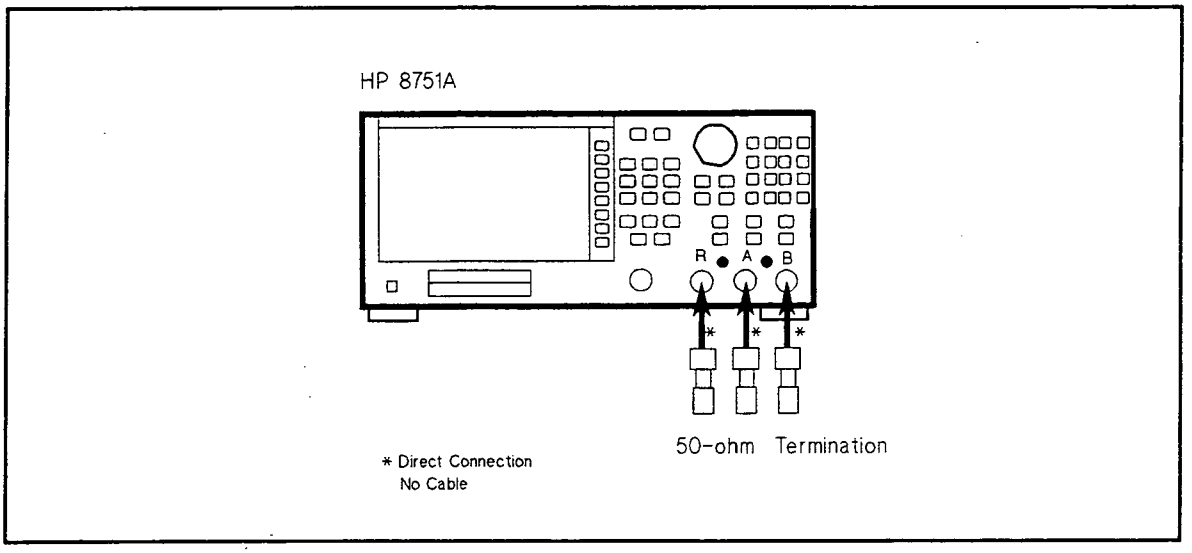


Figure 2-9. Receiver Noise Level Test Setup

2. Set up the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	(PRESET)
SPAN Freq. = 0 Hz	(SPAN), (0), (x1)
IF BW = 2 Hz	(AVG), IF BW, (2), (x1)
Meas. Config. : R, LIN MAG	(MEAS), R, (FORMAT), LIN MAG
Number of Points: 40	(MENU), NUMBER of POINTS, (4), (0), (x1)
Marker Function: STATISTICS ON	(MKR FCTN), STATISTICS on/OFF

3. Set the CENTER frequency in accordance with the following table, and note the trace mean value on the performance test record. (The trace mean value is displayed as a marker statistic (mean) in the upper right-hand corner of the CRT.) The Performance Record shows the specification in dBm. U (units) are related to volts and are defined by the following equation:

Power(dBm) = 20 LOG (Linear Magnitude measured value)

HP 8751A CENTER Frequency
5 Hz
205 Hz

4. Press (AVG), IF BW, (2), (0), (x1) to change the IF BW to 20 Hz.

5. Set the CENTER frequency in accordance with the following table, and record the input trace mean value on the performance test record. (Refer to step 3.)

HP 8751A CENTER Frequency
205 Hz
1 kHz
10 kHz
25 kHz
60 kHz
100 kHz
1.1 MHz
10 MHz
101 MHz
401 MHz
499 MHz

6. Press [AVG], [IF BW], [2], [0], [0], [x1] to change the IF BW to 200 Hz.

7. Set the CENTER frequency in accordance with the following table, and record the input trace mean value on the performance test record. (Refer to Step 3.)

HP 8751A CENTER Frequency
2 kHz
10 kHz
25 kHz
60 kHz
100 kHz
1.1 MHz
10 MHz
101 MHz
401 MHz
499 MHz

8. Press [AVG], [IF BW], [1], [k/m] to change the IF BW to 1 kHz.

9. Set the CENTER frequency in accordance with the following table, and record the input trace mean value on the performance test record. (Refer to Step 3.)

HP 8751A CENTER Frequency
100 kHz
1.1 MHz
10 MHz
101 MHz
401 MHz
499 MHz

10. Press [AVG], [IF BW], [4], [k/m] to change the IF BW to 4 kHz.

11. Set the CENTER frequency in accordance with the following table, and record the input trace mean value on the performance test record. (Refer to Step 3.)

HP 8751A CENTER Frequency
100 kHz
1.1 MHz
10 MHz
101 MHz
401 MHz
499 MHz

12. Change the HP 8751A control settings as follows:

Control Settings	Key Strokes
Meas. Config: A, LIN MAG	MEAS, A, FORMAT, LIN MAG
IF BW = 2 Hz	AVG, IF BW, 2, x1

13. Repeat the steps 3 through 11.
14. Change the HP 8751A control settings as follows:

Control Settings	Key Strokes
Meas. Config: B, LIN MAG	MEAS, B, FORMAT, LIN MAG
IF BW = 2 Hz	AVG, IF BW, 2, x1

15. Repeat the steps 3 through 11.

TRACE NOISE TEST

This test checks the HP 8751A's Trace Noise on a CW signal in ratio mode. This test is done in CW in order to eliminate any effects of frequency response.

Specification

(At Freq. $\geq$ 100 kHz, 1 kHz bandwidth, input level -10 dBm (ATT = 20 dB) or -30 dBm (ATT = 0dB)

Magnitude:	< 10 mdB rms
Phase:	< 50 mdeg rms

Test Equipment

N(m)-N(m) Cable, 61 cm	HP 11500B, 3ea
Three-way Power Splitter	HP 11850C
N(m)-N(m) Adapter	PN 1250-1475

Procedure

1. Connect the cables and the adapter as shown in Figure 2-10.

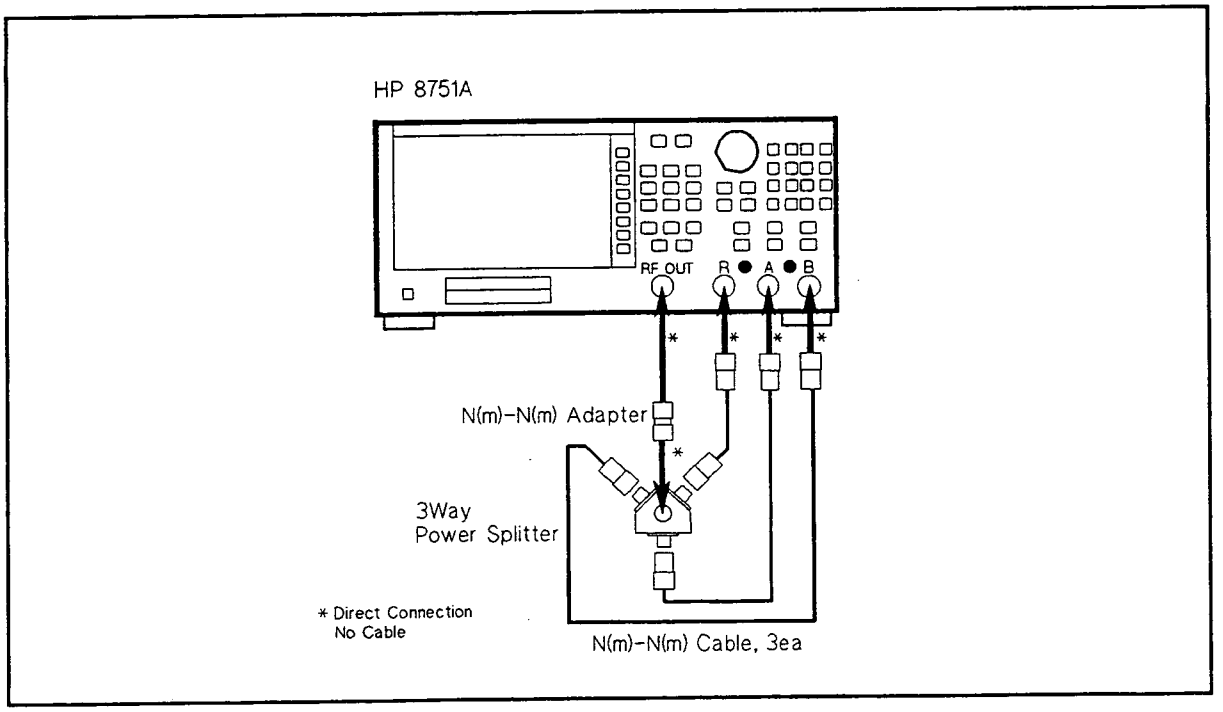


Figure 2-10. Trace Noise Test Setup

2. Set up the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
Source Power = -0.5 dBm	[MENU], POWER, [-], [0], [.], [5], [x1]

SPAN Freq. = 0 Hz	(SPAN), (0), (x1)
IF BW = 1 kHz	(AVG), IF BW, (1), (k/m)
CH 1: A/R, LOG MAG	(CH 1), (MEAS), A/R, (FORMAT), LOG MAG
CH 1: Marker Statistics ON	(CH 1), (MKR FCTN), STATISTICS on/OFF
CH 2: A/R, PHASE	(CH 2), (MEAS), A/R, (FORMAT), PHASE
CH 2: Marker Statistics ON	(CH 2), (MKR FCTN), STATISTICS on/OFF
Dual Channel: ON	(DISPLAY), DUAL CHAN on/OFF

3. Set the HP 8751A CENTER frequency in accordance with the following table.

   The standard deviation trace value is displayed as a marker statistic (s.dev) in the upper right-hand corner of the CRT on each channel's display. Record each s.dev value of the magnitude and phase in the Performance Test Record.

HP 8751A CENTER Frequency
100 kHz
1 MHz
10 MHz
100 MHz
500 MHz

4. Change the HP 8751A as follows:

Control Settings	Key Strokes
CH 1: B/R, LOG MAG	(CH 1), (MEAS), B/R, (FORMAT), LOG MAG
CH 2: B/R, PHASE	(CH 2), (MEAS), B/R, (FORMAT), PHASE

5. Repeat step 3.

6. Change the HP 8751A as follows:

Control Settings	Key Strokes
CH 1: A/B, LOG MAG	(CH 1), (MEAS), A/B, (FORMAT), LOG MAG
CH 2: A/B, PHASE	(CH 2), (MEAS), A/B, (FORMAT), PHASE

7. Repeat step 3.

RESIDUAL RESPONSE TEST

This tests the HP 8751A's Residual Response. This test measures how effectively the HP 8751A's internal oscillator signal's interference is reduced by measuring the amplitude at some known frequencies with its input terminated.

Specification

Residual Response:	-100 dBm to Input Range (IF BW $\leq$ 1 kHz, excluding line related and CRT scan related components)

Test Equipment

50 Ω Termination	HP 909C Opt.012, 2 ea.

Procedure

1. Connect a 50 Ω Termination to HP 8751A INPUT R, as shown in Figure 2-11.

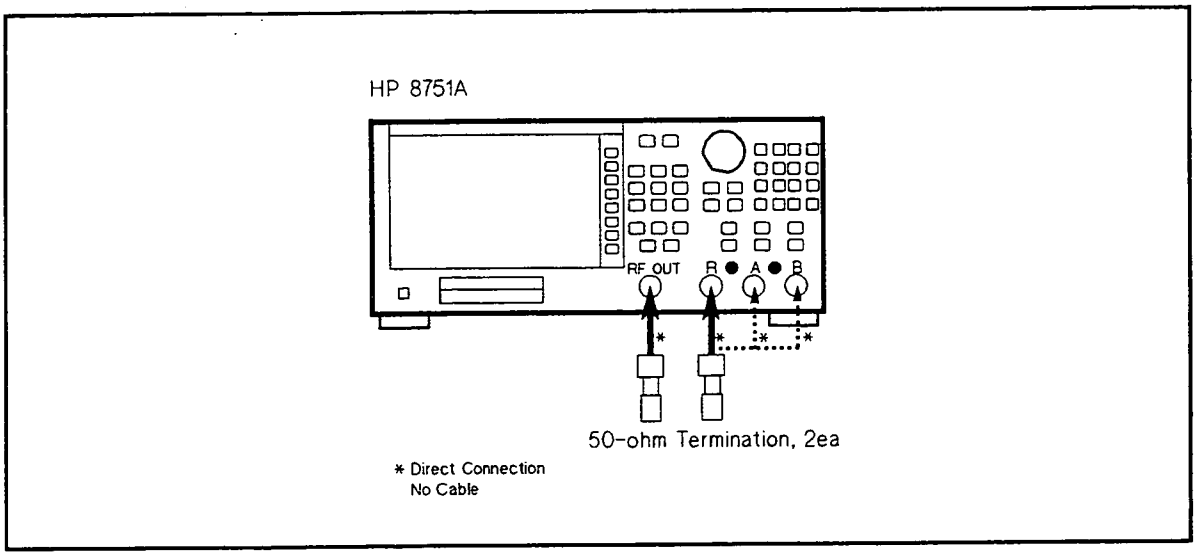


Figure 2-11. Residual Response Test Setup

2. Set up the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
CENTER Freq. = 6.25 MHz	[CENTER], [6], [.], [2], [5], [M/u]
Meas. Config. : R	[MEAS], R
SPAN = 0 Hz	[SPAN], [0], [x1]
IF BW = 20 Hz	[AVG], IF BW, [2], [0], [x1]
Number of Points: 21	[MENU], NUMBER of POINTS, [2], [1], [x1]

3. Perform the following key strokes for a single sweep measurement.

[MENU], TRIGGER MENU, SINGLE

4. Move the marker to the maximum point of the displayed data using the following key strokes. Record the maximum point in the Performance Test Record.

   (MKR FCTN), MKR SEARCH, MAX

5. Repeat steps 3 and 4, for the following HP 8751A CENTER FREQUENCY settings.

CENTER FREQUENCY
40.77575 MHz
43.004342105 MHz
45.480555556 MHz
48.248088235 MHz
51.3615625 MHz
54.890166667 MHz
58.922857143 MHz
139.968541667 MHz
152.835454545 MHz
281.4175 MHz
300 MHz
325 MHz
337.96225 MHz
362.270357143 MHz
375.687777778 MHz

6. Remove the 50 Ω Termination to HP 8751A Input-R, and connect it to HP 8751A Input-A.
7. Change the HP 8751A control settings as follows:

Control Settings	**Key Strokes**
CENTER Freq. = 6.25 MHz	(CENTER), (6), (.), (2), (5), (M/u)
MEAS Config. : A	(MEAS), A

8. Repeat steps 3 thourgh 5.
9. Remove the 50 Ω Termination to HP 8751A Input-A, and connect it to HP 8751A Input-B.
10. Change the HP 8751A control settings as follows:

Control Settings	**Key strokes**
CENTER Freq. = 6.25 MHz	(CENTER), (6), (.), (2), (5), (M/u)
MEAS Config. : B	(MEAS), B

11. Repeat steps 3 through 5.

INPUT CROSSTALK TEST

This tests the signal leakage interference between the HP 8751A's two inputs when one input is driven and the other is terminated.

Specification

Input Crosstalk:	(Same ATT for both input ports)
5 Hz ≤ Freq. < 10 kHz	< -95 dB
10 kHz ≤ Freq. ≤ 500 MHz	< -100 dB

Test Equipment

N(m)-N(m) Cable, 61 cm	HP 11500B
50 Ω Termination	HP 909C Opt.012, 2ea

Procedure

1. *—R into A Crosstalk and R into B Crosstalk—*

   a. Set up the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	(PRESET)
Source Power = -26 dBm	(MENU), POWER, (-), (2), (6), (x1)
STOP Freq. = 10 kHz	(STOP), (1), (0), (k/m)
Sweep Type: LOG FREQ	(MENU), SWEEP TYPE MENU, LOG FREQ
IF BW: 2 Hz	(AVG), IF BW, (2), (x1)
Averaging Factor: 4	(AVG), AVERAGING FACTOR, (4), (x1), AVERAGING on OFF
CH 1: A/R, LOG MAG	(CH 1), (MEAS), A/R, (FORMAT), LOG MAG
CH 2: B/R, LOG MAG	(CH 2), (MEAS), B/R, (FORMAT), LOG MAG
Dual Channel: ON	(DISPLAY), DUAL CHAN on/OFF
ATTEN: Input-R = 0 dB	(ATTEN), INPUT-R:0dB
ATTEN: Input-A = 0 dB	(ATTEN), INPUT-A:0dB
ATTEN: Input-B = 0 dB	(ATTEN), INPUT-B:0dB
Number of Points: 20	(MENU), NUMBER of POINTS, (2), (0), (x1)

   b. Connect an N(m)-N(m) Cable between HP 8751A RF OUT and Input-R, and connect a 50 Ω Termination to Input-A and Input-B as shown in Figure 2-12.

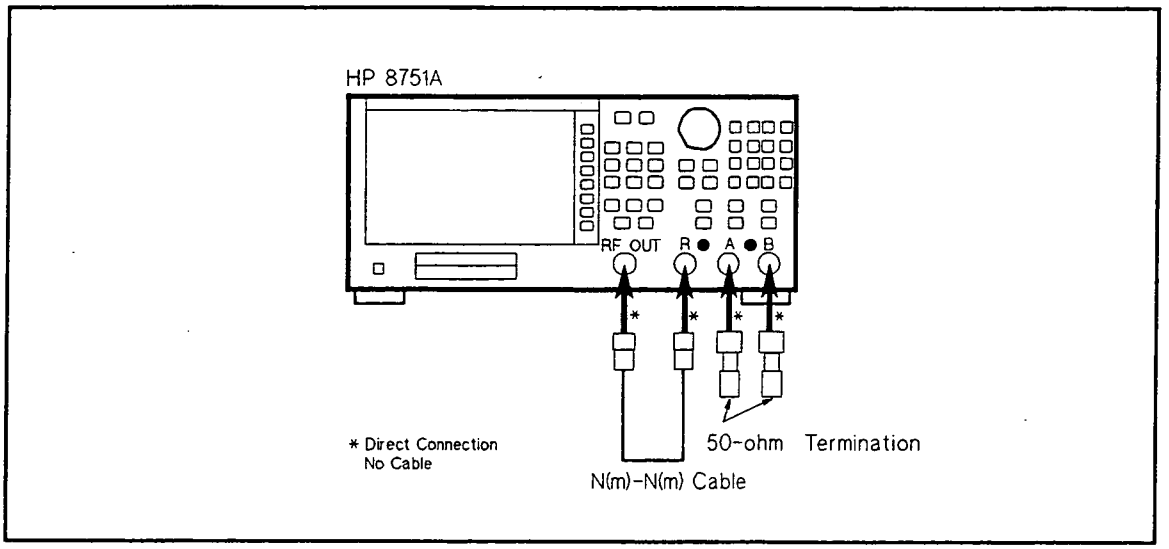


Figure 2-12. Crosstalk Test Setup 1

c. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

d. Move the CH 1 marker to the maximum value (A/R) using the following key strokes. Record the maximum value on the Performance Test Record.

(CH 1), (MKR FCTN), MKR SEARCH, MAX

e. Move the CH 2 marker to the maximum value (B/R) using the following key strokes. Record the maximum value on the Performance Test Record.

(CH 2), (MKR FCTN), MKR SEARCH, MAX

f. Change the HP 8751A as follows:

Control Settings	Key Strokes
START Freq. = 10 kHz	(START), (1), (0), (k/m)
STOP Freq. = 500 MHz	(STOP), (5), (0), (0), (M/u)
Source Power = -20 dBm	(MENU), POWER, (-), (2), (0), (x1)
IF BW: 20 Hz	(AVG), IF BW, (2), (0), (x1)
Number of Points: 201	(MENU), NUMBER of POINTS, (2), (0), (1), (x1)

g. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

h. Move the CH 1 marker to the maximum value (A/R) using the following key strokes. Record the maximum value on the Performance Test Record.

(CH 1), (MKR FCTN), MKR SEARCH, MAX

i. Move the CH 2 marker to the maximum value (B/R) using the following key strokes. Record the maximum value on the Performance Test Record.

(CH 2), (MKR FCTN), MKR SEARCH, MAX

2. *—A into R Crosstalk and A into B Crosstalk—*

a. Connect the equipment as shown in Figure 2-13.

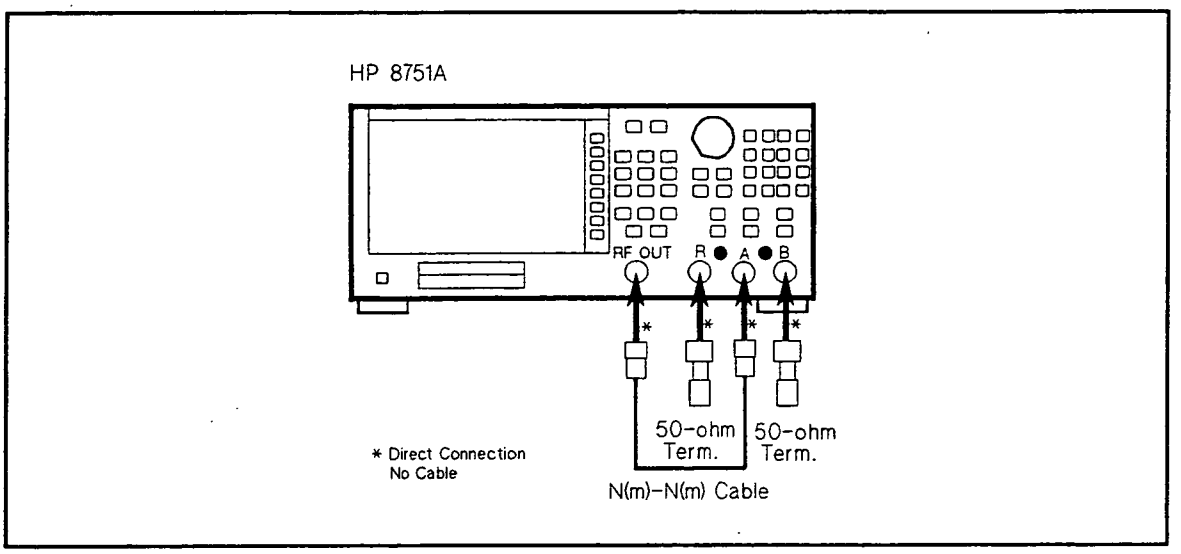


Figure 2-13. Crosstalk Test Setup 2

b. Change the HP 8751A as follows:

Control settings	Key Strokes
Source Power = -26 dBm	(MENU), POWER, (-), (2), (6), (x1)
START Freq. = 5 Hz	(START), (5), (Hz)
STOP Freq. = 10 kHz	(STOP), (1), (0), (k/m)
CH 1: A/R, LOG MAG	(CH 1), (MEAS), A/R, (FORMAT), LOG MAG
CH 2: A/B, LOG MAG	(CH 2), (MEAS), A/B, (FORMAT), LOG MAG
IF BW: 2 Hz	(AVG), IF BW, (2), (x1)
Number of Points: 20	(MENU), NUMBER of POINTS, (2), (0), (x1)

c. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

d. Move the CH 1 marker to the minimum value (A/R) using the following key strokes. Record the minimum value reverse the sign on the Performance Test Record.

(CH 1), (MKR FCTN), MKR SEARCH, MIN

e. Move the CH 2 marker to the minimum value (A/B) using the following key strokes. Record the minimum value reverse the on the Performance Test Record.

(CH 2), (MKR FCTN), MKR SEARCH, MIN

f. Change the HP 8751A as follows:

Control Settings	Key Strokes
START Freq. = 10 kHz	START, 1, 0, k/m
STOP Freq. = 500 MHz	STOP, 5, 0, 0, M/u
Source Power = -20 dBm	MENU, POWER, -, 2, 0, x1
IF BW: 20 Hz	AVG, IF BW, 2, 0, x1
Number of Points: 201	MENU, NUMBER of POINTS, 2, 0, 1, x1

g. Perform the following key strokes for a single sweep measurement.

MENU, TRIGGER MENU, SINGLE

h. Move the CH 1 marker to the minimum value (A/R) using the following key strokes. Record the minimum value reverse the sign on the Performance Test Record.

CH 1, MKR FCTN, MKR SEARCH, MIN

i. Move the CH 2 marker to the minimum value (A/B) using the following key strokes. Record the minimum value reverse the sign on the Performance Test Record.

CH 2, MKR FCTN, MKR SEARCH, MIN

3. *—B into R Crosstalk and B into A Crosstalk—*

a. Connect the equipment as shown in Figure 2-14.

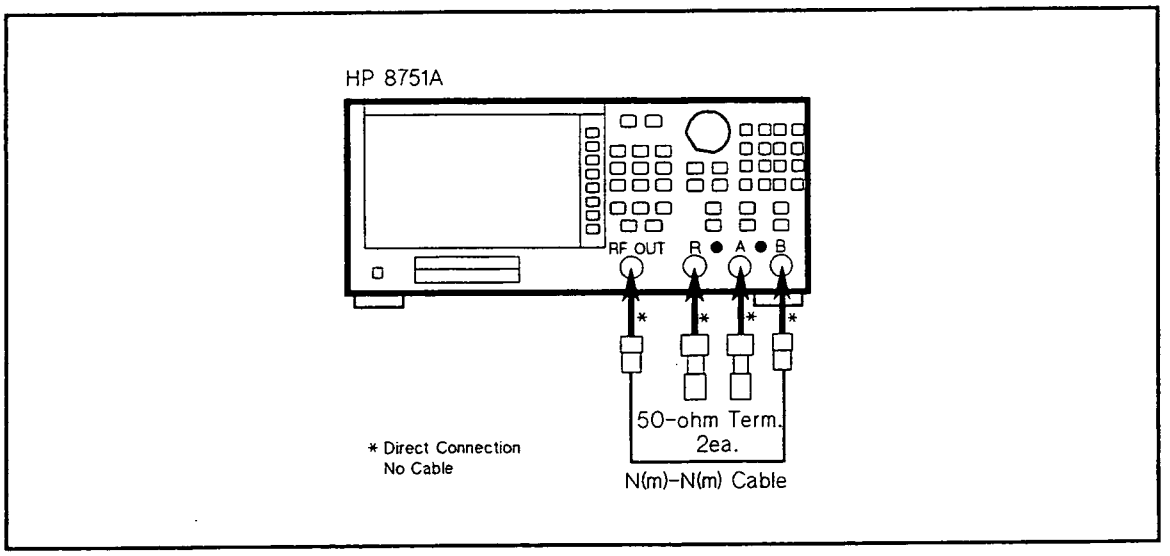


Figure 2-14. Crosstalk Test Setup 3

b. Change the HP 8751A as follows.

Control settings	Key strokes
Source Power = -26 dBm	MENU, POWER, -, 2, 6, x1
START Freq. = 5 Hz	START, 5, Hz
STOP Freq. = 10 kHz	STOP, 1, 0, k/m
CH 1: B/R, LOG MAG	CH 1, MEAS, B/R, FORMAT, LOG MAG

CH 2: A/B, LOG MAG	(CH 2), (MEAS), A/B, (FORMAT), LOG MAG
IF BW: 2 Hz	(AVG), IF BW, (2), (x1)
Number of Points: 20	(MENU), NUMBER of POINTS, (2), (0), (x1)

c. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

d. Move the CH 1 marker to the minimum value (B/R) using the following key strokes. Record the minimum value reverse the sign on the Performance Test Record.

(CH 1), (MKR FCTN), MKR SEARCH, MIN

e. Move the CH 2 marker to the maximum value (A/B) using the following key strokes. Record the maximum value on the Performance Test Record.

(CH 2), (MKR FCTN), MKR SEARCH, MAX

f. Change the HP 8751A as follows:

Control Settings	**Key strokes**
START Freq. = 10 kHz	(START), (1), (0), (k/m)
STOP Freq. = 500 MHz	(STOP), (5), (0), (0), (M/u)
Source Power = -20 dBm	(MENU), POWER, (-), (2), (0), (x1)
IF BW: 20 Hz	(AVG), IF BW, (2), (0), (x1)
Number of Points: 201	(MENU), NUMBER of POINTS, (2), (0), (1), (x1)

g. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

h. Move the CH 1 marker to the minimum value (B/R) using the following key strokes. Record the minimum value reverse the sign on the Performance Test Record.

(CH 1), (MKR FCTN), MKR SEARCH, MIN

i. Move the CH 2 marker to the maximum value (A/B) using the following key strokes. Record the maximum value on the Performance Test Record.

(CH 2), (MKR FCTN), MKR SEARCH, MAX

INPUT IMPEDANCE TEST

This test checks the HP 8751A's input impedance by measuring the return loss.

Specification

Input Impedance: 50 Ω Nominal

Frequency	ATT = 0 dB	ATT = 20 dB
5 Hz ≤ Freq. ≤ 100 MHz	> 20 dB	> 25 dB
100 MHz < Freq. ≤ 300 MHz	> 15 dB	> 25 dB
300 MHz < Freq. ≤ 500 MHz	> 10 dB	> 20 dB

Test Equipment

50 Ω T/R Test Kit	HP 87512A
50 Ω type-N calibration kit	HP 85032B
50 Ω type-N RF cable set	HP 11851B
N(f)-N(f) Adapter	PN 1250-0777, 2 ea.

Procedure

1. *—Input B Impedance Test—*

   a. Connect the equipment as shown in Figure 2-15.

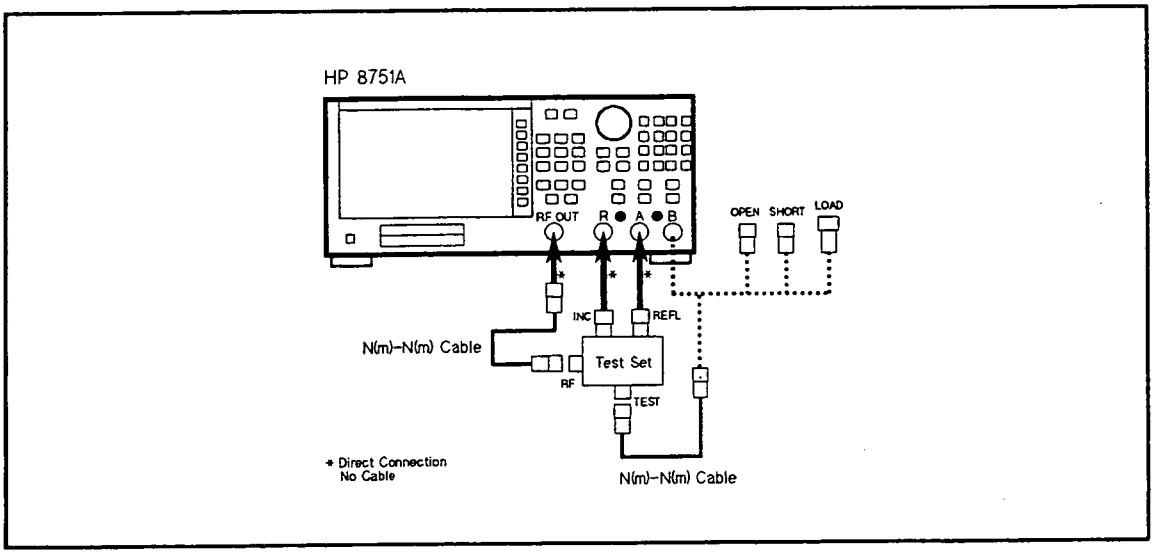


Figure 2-15. Input B Impedance Test Setup

   b. Set up the HP 8751A as follows:

Control Settings	Key strokes
PRESET	PRESET
Meas. Config.: A/R	MEAS, A/R
Source Power: -18 dBm	MENU, POWER, -, 1, 8, x1

IF BW: AUTO	(AVG), IF BW, IF BW AUTO
Sweep Type: LOG SWEEP	(MENU), SWEEP TYPE MENU, LOG FREQ

c. Perform the following sequence to do the one port calibration.

i. Press (CAL), CAL KIT, N 50 Ω, RETURN, CALIBRATE MENU, S11 1-PORT

ii. Connect a type-N(f) open to the test port cable and press OPENS, OPEN[M], DONE:OPENS.

iii. Connect a type-N(f) short to the test port cable and press SHORTS, SHORT[M], DONE:SHORTS.

iv. Connect a type-N(f) 50 Ω Termination (LOAD) to the test port cable and press LOAD, DONE 1-PORT CAL.

d. Remove the 50 Ω Termination from the test port cable and connect the cable to the open input port of the analyzer.

e. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

f. Press (SCALE REF), AUTO SCALE.

g. Perform the following key strokes to set the marker search range from 5 Hz to 100 MHz.

(MKR), ACTIVE MARKER, MARKER 1, (5), (x1), ACTIVE MARKER, MARKER 2, (1), (0), (0), (M/u), (MKR), Δ MODE MENU, Δ REF MARKER, Δ REF = 1, (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE, PART SRCH on/OFF

h. Move the marker to the maximum value using the following key strokes. Record the maximum value with an opposite sign in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), Δ MODE MENU, Δ MODE OFF

i. Press Δ REF MARKER, Δ REF = 1.

j. Perform the following key strokes to set the marker search range from 100 MHz to 300 MHz.

(MKR), ACTIVE MARKER, MARKER 1, (9), (9), (.), (9), (9), (9), (9), (9), (5), (M/u), (MKR), ACTIVE MARKER, MARKER 2, (2), (0), (0), (M/u), (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE

k. Move the marker to the maximum value using the following key strokes. Record the maximum value with an opposite sign in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), Δ MODE MENU, Δ MODE OFF

l. Press Δ REF MARKER, Δ REF = 1.

m. Perform the following key strokes to set the marker search range from 300 MHz to 500 MHz.

(MKR), ACTIVE MARKER, MARKER 1, (2), (0), (0), (M/u), (MKR), ACTIVE MARKER, MARKER 2, (3), (0), (0), (M/u), (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE

n. Move the marker to the maximum value using the following key strokes. Record the maximum value with an opposite sign in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), △ MODE MENU, △ MODE OFF

o. Change the HP 8751A Cotrol Settings as follows:

Control Settings	Key Strokes
ATTEN: Input-B = 0 dB	(ATTEN), INPUT-B: 0 dB

p. Repeat steps e through n in Step 1.

2. *—Input A Impedance Test—*

a. Connect the equipment as shown in Figure 2-16.

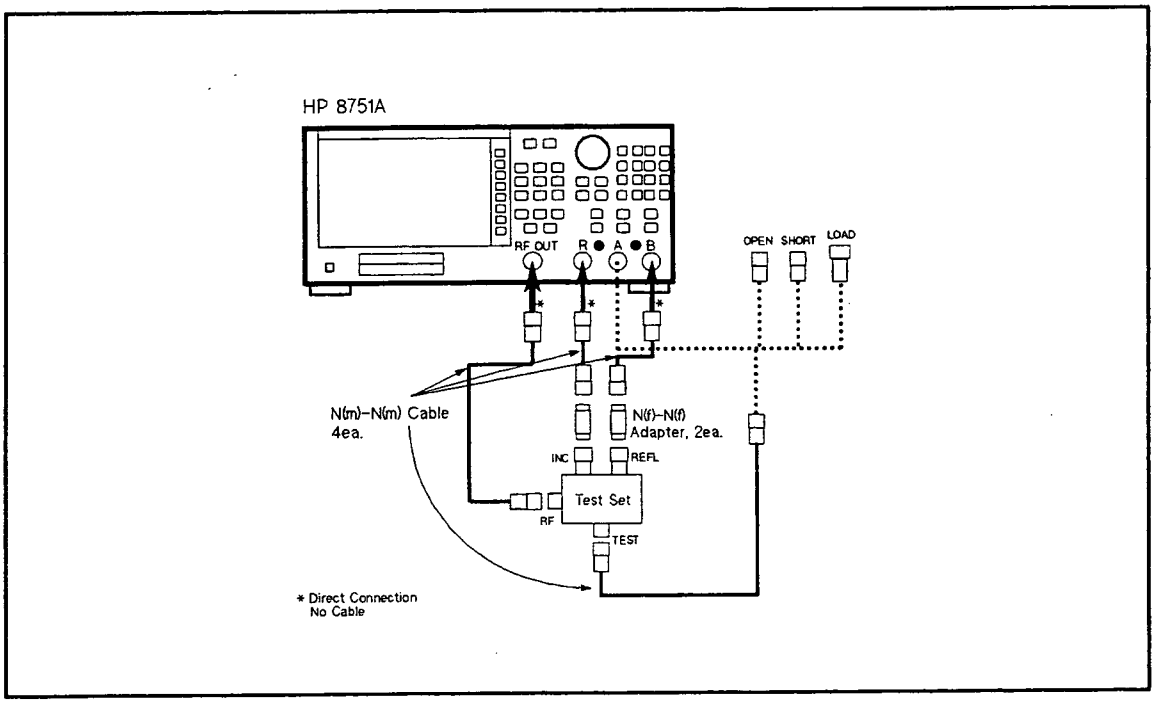


Figure 2-16. Input A Impedance Setup

b. Change the HP 8751A control settings as follows:

Control Settings	Key Strokes
PRESET	(PRESET)
Meas. Config.: B/R	(MEAS), B/R
IF BW: AUTO	(AVG), IF BW, IF BW AUTO
Source Power: -18 dBm	(MENU), POWER, (-), (1), (8), (x1)
Sweep Type: LOG SWEEP	(MENU), SWEEP TYPE MENU, LOG FREQ

c. Perform the following sequence to do the one port calibration.

i. Press (CAL), CAL KIT, N 50 Ω, RETURN, CALIBRATE MENU, S11 1-PORT

ii. Connect a type-N(f) open to the test port cable and press OPENS, OPEN[M], DONE:OPENS.

iii. Connect a type-N(f) short to the test port cable and press SHORTS, SHORT[M], DONE:SHORTS.

iv. Connect a type-N(f) 50 Ω Termination (LOAD) to the test port cable and press LOAD, DONE 1-PORT CAL.

d. Remove the 50 Ω Termination from the test port cable and connect the cable to the open input port of the analyzer.

e. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

f. Press (SCALE REF), AUTO SCALE.

g. Perform the following key strokes to set the marker search range from 5 Hz to 100 MHz.

(MKR), ACTIVE MARKER, MARKER 1, (5), (x1), ACTIVE MARKER, MARKER 2, (1), (0), (0), (M/u), (MKR), △ MODE MENU, △ REF MARKER, △ REF = 1, (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE

h. Move the marker to the maximum value using the following key strokes. Record the maximum value with an opposite sign in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), △ MODE MENU, △ MODE OFF

i. Press △ REF MARKER, △ REF = 1.

j. Perform the following key strokes to set the marker search range from 100 MHz to 300 MHz.

(MKR), ACTIVE MARKER, MARKER 1, (9), (9), (.), (9), (9), (9), (9), (9), (5), (M/u), (MKR), ACTIVE MARKER, MARKER 2, (2), (0), (0), (M/u), (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE

k. Move the marker to the maximum value using the following key strokes. Record the maximum value with an opposite sign in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), △ MODE MENU, △ MODE OFF

l. Press △ REF MARKER, △ REF = 1.

m. Perform the following key strokes to set the marker search range from 300 MHz to 500 MHz.

(MKR), ACTIVE MARKER, MARKER 1, (2), (0), (0), (M/u), (MKR), ACTIVE MARKER, MARKER 2, (3), (0), (0), (M/u), (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE

n. Move the marker to the maximum value using the following key strokes. Record the maximum value with an opposite sign in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), △ MODE MENU, △ MODE OFF

o. Press △ REF MARKER, △ REF = 1.

p. Change the HP 8751A Cotrol Settings as follows:

Control Settings	Key Strokes
ATTEN: Input-A = 0 dB	(ATTEN), INPUT-A: 0 dB

q. Repeat steps e through n in Step 2.

3. —*Input R Impedance Test*—

a. Connect the equipment as shown in Figure 2-17.

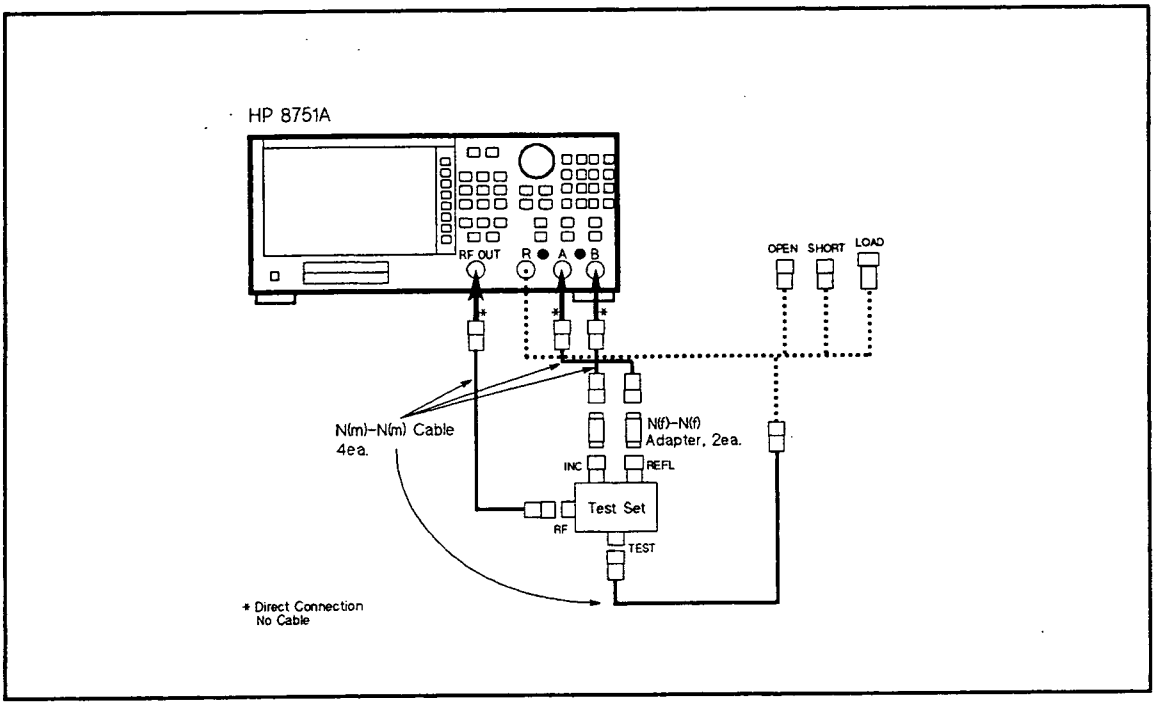


Figure 2-17. Input R Impedance Setup

b. Set up the HP 8751A as follows:

Control Settings	Key strokes
PRESET	(PRESET)
Meas. Config.: A/B	(MEAS), A/B
IF BW: AUTO	(AVG), IF BW, IF BW AUTO
Source Power: -18 dBm	(MENU), POWER, (-), (1), (8), (x1)
Sweep Type: LOG SWEEP	(MENU), SWEEP TYPE MENU, LOG FREQ

c. Perform the following sequence to do the one port calibration.

i. Press (CAL), CAL KIT, N 50 Ω, RETURN, CALIBRATE MENU, S11 1-PORT

ii. Connect a type-N(f) open to the test port cable and press OPENS, OPEN[M], DONE:OPENS.

iii. Connect a type-N(f) short to the test port cable and press SHORTS, SHORT[M], DONE:SHORTS.

iv. Connect a type-N(f) 50 Ω Termination (LOAD) to the test port cable and press LOAD, DONE 1-PORT CAL.

d. Remove the 50 Ω Termination from the test port cable and connect the cable to the open input port of the analyzer.

e. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

f. Press (SCALE REF), AUTO SCALE.

g. Perform the following key strokes to set the marker search range from 5 Hz to 100 MHz.

(MKR), ACTIVE MARKER, MARKER 2, (1), (0), (0), (M/u), (MKR), △ MODE MENU, △ REF MARKER, △ REF = 1, (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE

h. Move the marker to the maximum value using the following key strokes. Record the maximum value with an opposite sign in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), △ MODE MENU, △ MODE OFF

i. Press △ REF MARKER, △ REF = 1.

j. Perform the following key strokes to set the marker search range from 100 MHz to 300 MHz.

(MKR), ACTIVE MARKER, MARKER 1, (9), (9), (.), (9), (9), (9), (9), (9), (5), (M/u), (MKR), ACTIVE MARKER, MARKER 2, (2), (0), (0), (M/u), (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE

k. Move the marker to the maximum value using the following key strokes. Record the maximum value with an opposite sign in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), △ MODE MENU, △ MODE OFF

l. Press △ REF MARKER, △ REF = 1.

m. Perform the following key strokes to set the marker search range from 300 MHz to 500 MHz.

(MKR), ACTIVE MARKER, MARKER 1, (2), (0), (0), (M/u), (MKR), ACTIVE MARKER, MARKER 2, (3), (0), (0), (M/u), (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE

n. Move the marker to the maximum value using the following key strokes. Record the maximum value with an opposite sign in the Performance Test Record.

(MKR FCTN), MKR SEARCH, MAX, (MKR), △ MODE MENU, △ MODE OFF

o. Change the HP 8751A Cotrol Settings as follows:

Control Settings	Key Strokes
ATTEN: Input-R = 0 dB	(ATTEN), INPUT-R: 0 dB

p. Repeat steps e through n in Step 3.

ABSOLUTE AMPLITUDE ACCURACY TEST

This test checks the HP 8751A's absolute amplitude accuracy. A digital voltmeter or a power meter is used to measure each actual output level.

Specification

(At 23 ±5°C, −30 dBm for ATT = 0 dB, or −10 dBm for ATT = 20 dB)

5 Hz ≤ Freq. ≤ 300 MHz:	±1.0 dB
300 MHz < Freq. ≤ 500 MHz:	±1.5 dB

Test Equipment

Power Meter	HP 436A
Power Sensor	HP 8482A
Digital Multimeter	HP 3458A
Power Splitter	HP 11667A
N(m)-N(m) Cable	HP 11500B
BNC(m)-BNC(m) Cable, 61 cm	PN 8120-1839
N(m)-N(m) Adapter	PN 1250-1475
N(m)-BNC(f) Adapter	PN 1250-1476
BNC(f)-Dual Banana Plug	PN 1251-2277
50 Ω Feedthrough	PN 04192-61002
20 dB Attenuator Pad	HP 8491A Opt. 020

Note

The HP 8491A Opt. 020 attenuator pad must be calibrated at the following frequencies (Uncertainty: ≤ 0.06 B).

1 MHz	100 MHz
10 MHz	300 MHz
30 MHz	500 MHz
50 MHz	

So when you purchase the HP 8491A Opt. 020, contact your nearest Hewlett-Packard service center for the required calibration frequency and uncertainty.

Procedure

1. Connect the Digital Multimeter as shown in Figure 2-18.

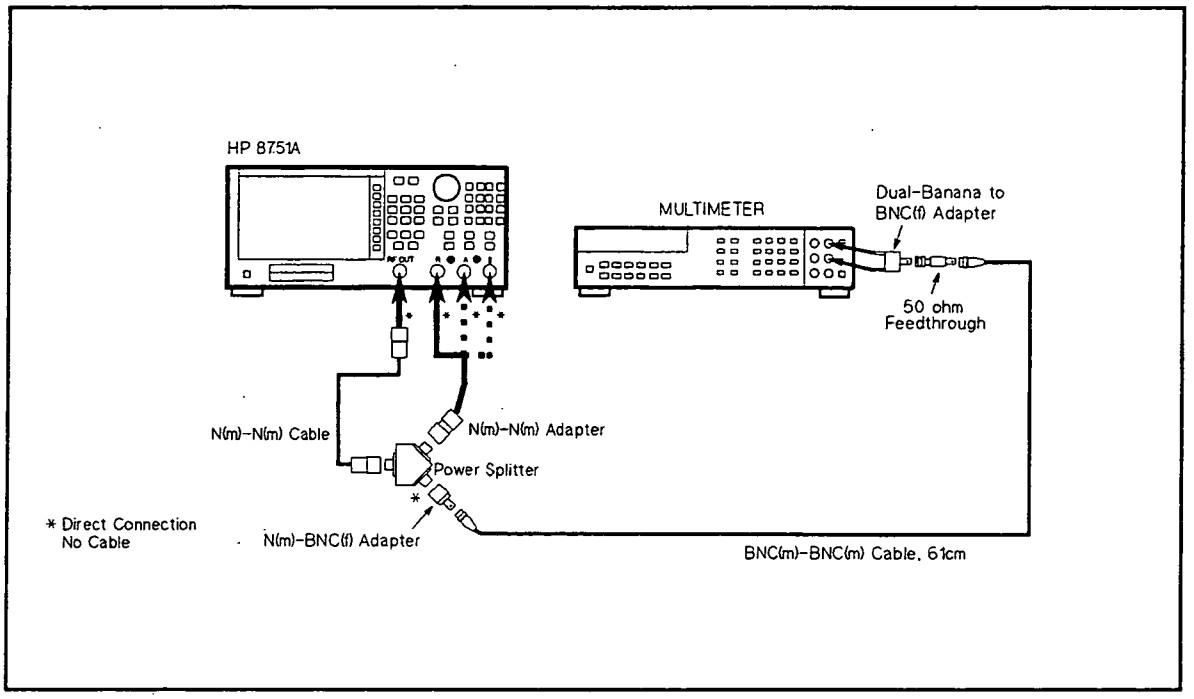


Figure 2-18. Absolute Amplitude Accuracy Test Setup 1

2. Set up the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
SPAN = 0 Hz	[SPAN], [0], [x1]
IF BW = 2 Hz	[AVG], IF BW, [2], [x1]
Source Power = -24 dBm	[MENU], POWER, [-], [2], [4], [x1]
Number of Points: 2	[MENU], NUMBER of POINTS, [2], [x1]
Meas.Config: R	[MEAS], R
ATTEN: Input-R, 0 dB	[ATTEN], INPUT-R: 0dB
ATTEN: Input-A, 0 dB	[ATTEN], INPUT-A: 0dB
ATTEN: Input-B, 0 dB	[ATTEN], INPUT-B: 0dB
Marker Function: ON	[MKR FCTN]

3. Set the Digital Multimeter as follows:

Measurement Function:	AC Volts mode
Display Reading Value:	dBm reading value
Measurement Method:	Synchronous Sampling Conversion

4. Set the HP 8751A CENTER FREQUENCY according to the following table. Then record the readings of the Digital Multimeter, and the HP 8751A's readings in the Calculation Sheet.

Center Frequency
5 Hz
10 Hz
100 Hz
100 kHz
200 kHz
500 kHz

5. Connect the Power Sensor to the Power Meter, and calibrate the Power Meter for the Power Sensor.
6. Remove the digital multimeter from the power splitter, and connect the power sensor to the power splitter as shown in Figure 2-19.

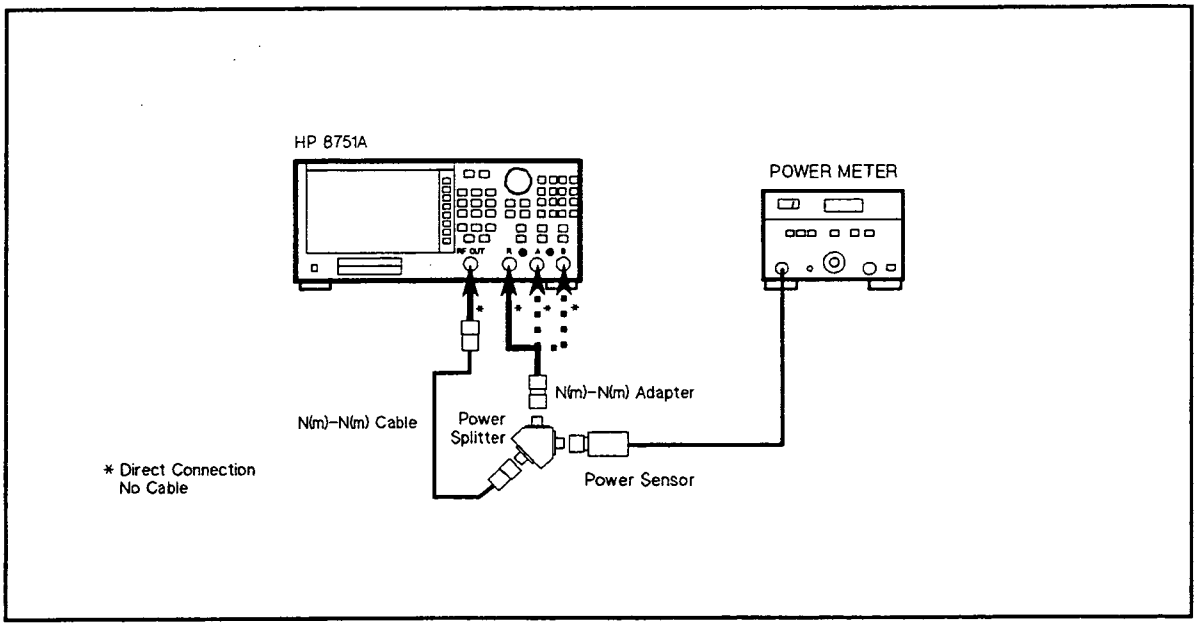


Figure 2-19. Absolute Amplitude Accuracy Test Setup 2

7. Set the HP 8751A as follows:

CENTER Freq. = 50 MHz	[CENTER], [5], [0], [M/u]
IF BW: 20 Hz	[AVG], IF BW, [2], [0], [x1]
Source Power = -4 dBm	[MENU], [POWER], [-], [4], [x1]
ATTEN: Input-R, 20 dB	[ATTEN], INPUT-R: 20 dB
ATTEN: Input-A, 20 dB	[ATTEN], INPUT-A: 20 dB
ATTEN: Input-B, 20 dB	[ATTEN], INPUT-B: 20 dB

8. Record the readings of the Power Meter and the HP 8751A in the Calculation Sheet.
9. Record the 20 dB Pad Calibration Values on the Calculation Sheet.

10. Remove the Power Splitter from the front panel, and connect the 20 dB Pad as shown in Figure 2-20.

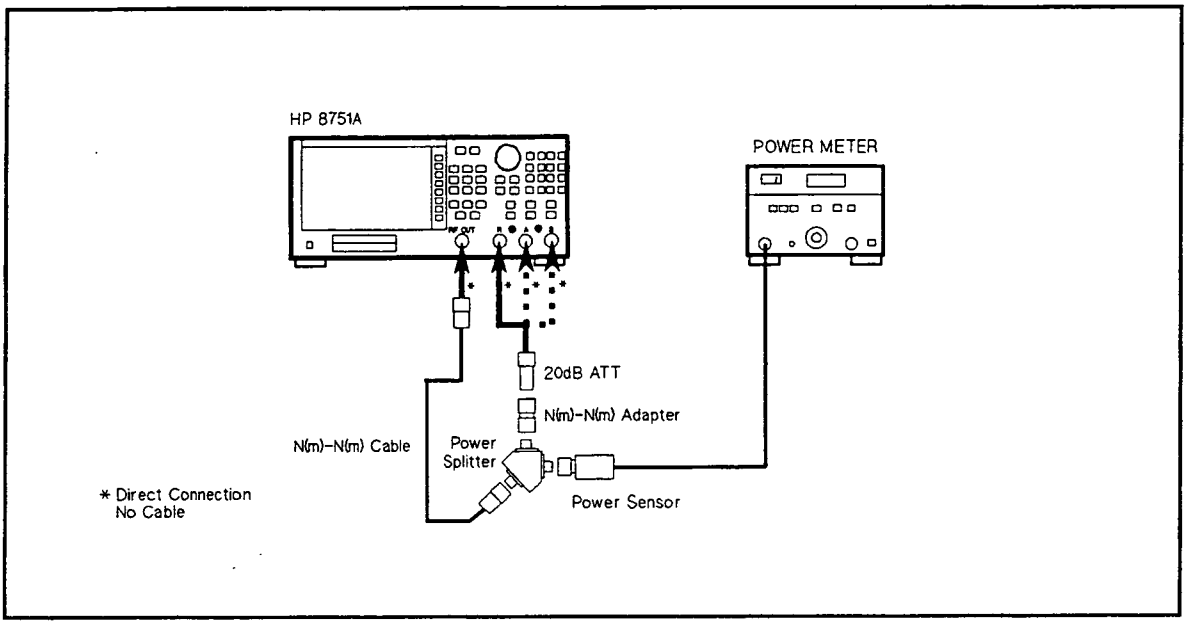


Figure 2-20. Absolute Amplitude Accuracy Test Setup 3

11. Set the HP 8751A Control Settings as follows:

ATTEN: Input-R, 0 dB	(ATTEN), INPUT-R: 0 dB
ATTEN: Input-A, 0 dB	(ATTEN), INPUT-A: 0 dB
ATTEN: Input-B, 0 dB	(ATTEN), INPUT-B: 0 dB

12. Set the HP 8751A CENTER FREQUENCY according to the following table. Then record the readings of the power meter and the HP 8751A in the Calculation Sheet.

Center Frequency
1 MHz
10 MHz
30 MHz
50 MHz
100 MHz
300 MHz
500 MHz

13. Remove the 20 dB Pad from the Input-R, and disconnect the N(m)-N(m) Adapter from the 20 dB Pad, and connect it to the input-A.
14. Disconnect the Power Sensor from the Power Splitter, and connect the Digital Multimeter as shown in Figure 2-18.
15. Press (MEAS), A, (MEAS), POWER, (-), (2), (4), (x1), (AVG), IF BW, (2), (x1).
16. Repeat steps 4 through 12.

17. Remove the 20 dB Pad from the Input-A, and disconnect the N(m)-N(m) Adapter from the 20 dB Pad, and connect it to the input-B.
18. Disconnect the Power Sensor from the Power Splitter, and connect the Digital Multimeter as shown in Figure 2-18.
19. Press (MEAS), B, (MEAS), POWER, (-), (2), (4), (x1), (AVG), IF BW, (2), (x1).
20. Repeat steps 4 through 12.

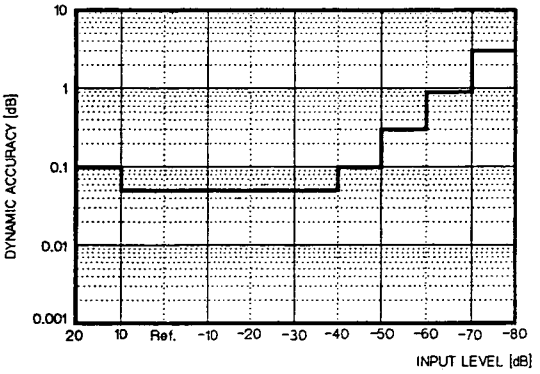
MAGNITUDE RATIO/PHASE DYNAMIC ACCURACY TEST

This test measures the HP 8751A's Dynamic Accuracy. The dynamic accuracy is a measure of how well the receiver measure the magnitude and phase components of a signal as that signal varies in amplitude over the specified dynamic range.

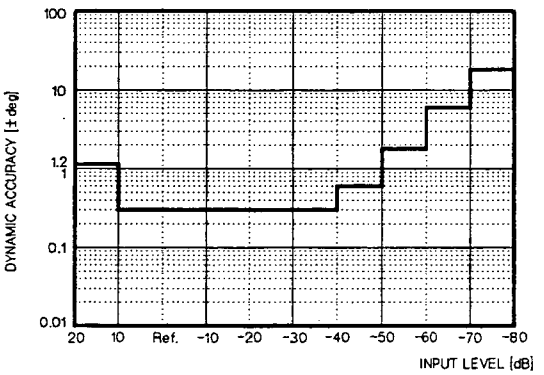
Specification

(At 23 ± 5°C, 20 Hz bandwidth, Freq. ≥ 1 kHz)

Magnitude Ratio :



Phase :



Input Level : A/R and B/R – Rch. Input Level = −10dBm (@ATT = 20dB) or −30dBm (@ATT = 0dB)

A/B – Bch. Input Level = −10dBm (@ATT = 20dB) or −30dBm (@ATT = 0dB)

Assumption : Ref. Input Level = −20dBm (@ATT = 20dB) or −40dBm (@ATT = 0dB)

Test Equipment

Power Splitter	HP 11667A
Step Attenuator	HP 8496A/G Opt.001 & H60
Attenuator Pad 6 dB	HP 8491A Opt.006 & H60
Attenuator Pad 6 dB	HP 8491A Opt.006
Attenuator Pad 10 dB	HP 8491A Opt.010 & H60
Attenuator Pad 10 dB	HP 8491A Opt.010, 2 ea
N(m)-N(m) Cable, 61 cm	HP 11500B, 3 ea
N(m)-N(m) Adapter	PN 1250-1475

Note

- An HP 8496A/G Step attenuator with required low VSWR (< 1.02) can be purchased by specifying option H60, then contact your nearest Hewlett-Packard service center for the required calibration frequency and calibration uncertainty. If your attenuator is an HP 8496G (remote control), also provide the segment actuation sequence for every attenuation as listed below.

Attenuation	Activated Segment
40 dB	4
50 dB	1 and 4
60 dB	2 and 4
70 dB	1, 2, and 4

- An HP 8491A option 006 or option 010 fixed attenuator with required low VSWR (< 1.015) can be purchased by specifying option H60.

Procedure

1. Record the Step Attenuator 50 MHz Calibration Value on the Calculation Sheet.
2. *—A/R Dynamic Accuracy Test (Magnitude Ratio (50 MHz) and Phase (3 MHz))—*
   a. Connect the test equipment as shown in Figure 2-21.

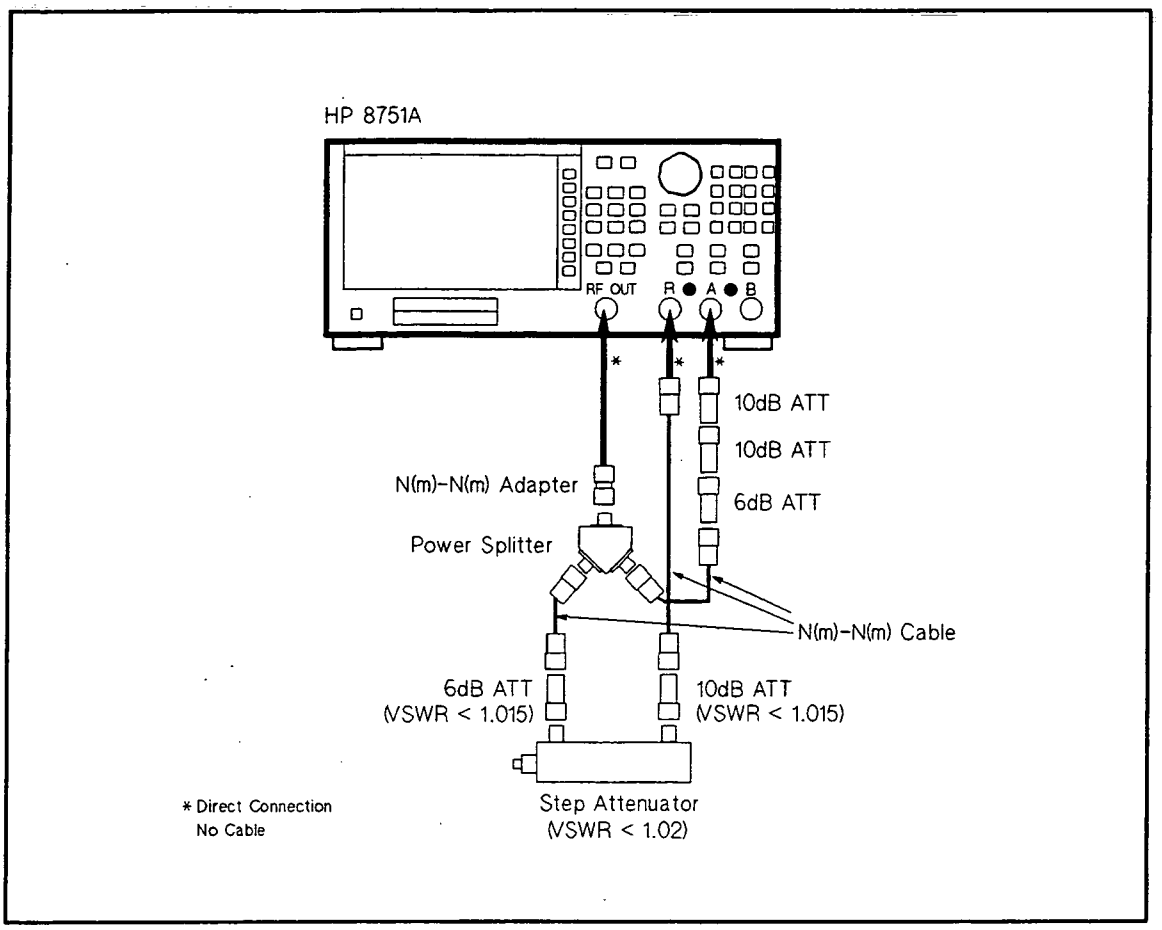


Figure 2-21. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 1

b. Set the Step Attenuator to 0 dB.

c. Set the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
CH1: A/R, LOG MAG	[CH 1], [MEAS], A/R, [FORMAT], LOG MAG
CH2: A/R, PHASE	[CH 2], [MEAS], A/R, [FORMAT], PHASE
Dual Channel: ON	[DISPLAY], DUAL CHAN on/OFF
START Freq. = 3 MHz	[START], [3], [M/u]
STOP Freq. = 50 MHz	[STOP], [5], [0], [M/u]
Number of Points = 2	[MENU], NUMBER of POINTS, [2], [x1]
Source Power = -8 dBm	[MENU], POWER, [-], [8], [x1]
IF BW: 20 Hz	[AVG], IF BW, [2], [0], [x1]
Markers: Discrete, Coupled	[MKR], MARKER MODE MENU, MARKERS:DISCRETE, MARKERS:COUPLED
ATTEN: Input-R = 0 dB	[ATTEN], INPUT-R: 0dB
ATTEN: Input-A = 0 dB	[ATTEN], INPUT-A: 0dB

ATTEN: Input-B = 0 dB (ATTEN), INPUT-B: 0dB

d. Perform the following key strokes to do a pass loss calibration.

(CAL), CAL KIT, CAL KIT: N 50Ω, (CAL), CALIBRATE MENU, RESPONSE, THRU, DONE:RESPONSE

e. Set the Step Attenuator to 10 dB.

f. Press (MENU), POWER, (2), (x1) to change the source power from -8 dBm to +2 dBm.

g. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

h. Rotate the RPG knob, and read the magnitude ratio value at 50 MHz and the phase at 3 MHz. Then record these values on the Calculation Sheet.

i. Set the Step Attenuator to 20 dB.

j. Press (MENU), POWER, (1), (2), (x1) to change the output power from +2 dBm to +12 dBm.

k. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

l. Rotate the RPG knob, and read the phase measurement result at 3 MHz and the magnitude ratio measurement result at 50 MHz. Then record these results on the Calculation Sheet.

m. Press (MENU), POWER, (-), (8), (x1) to change the output power from +12 dBm to -8 dBm.

n. Change the cable connection as shown in Figure 2-22.

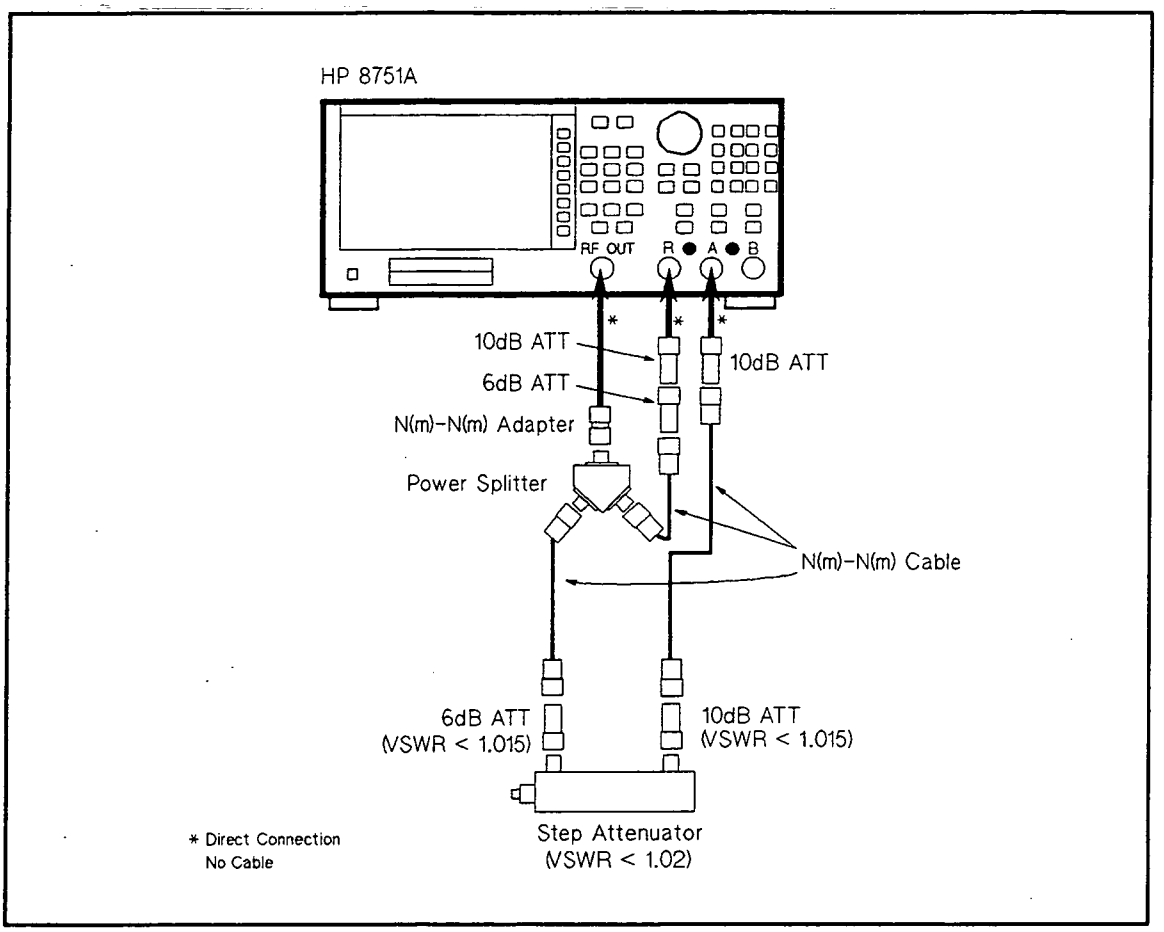


Figure 2-22. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 2

o. Change the Step Attenuator to 0 dB.

p. Perform the following key strokes to do a pass loss calibration.

(CAL), CALIBRATE MENU, RESPONSE, THRU, DONE:RESPONSE

q. Set the Step Attenuator to 10 dB.

r. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

s. Rotate the RPG knob, and read the phase measurement result at 3 MHz and the magnitude ratio measurement result at 50 MHz. Then record these results on the Calculation Sheet.

t. Set the Step Attenuator from 20 dB to 80 dB in 10 dB steps, and repeat steps r and s in step 2 for every attenuation setting.

3. *—B/R Dynamic Accuracy Test (Magnitude Ratio (50 MHz) and Phase (3 MHz))—*

a. Connect the test equipment as shown in Figure 2-23.

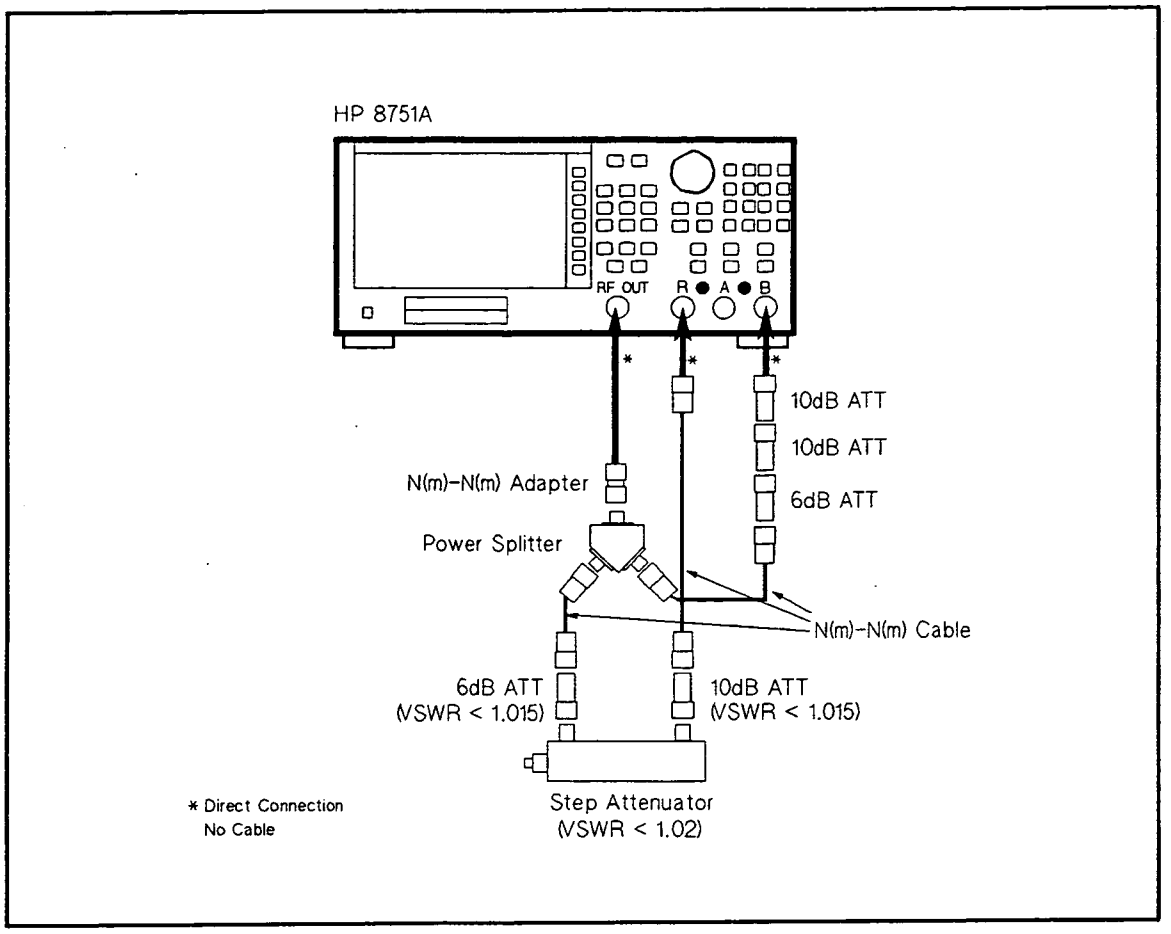


Figure 2-23. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 3

b. Set the Step Attenuator to 0 dB.

c. Change the HP 8751A control settings as follows:

Control Settings	Key Strokes
CH1: B/R, LOG MAG	[CH 1], [MEAS], B/R, [FORMAT], LOG MAG
CH2: B/R, PHASE	[CH 2], [MEAS], B/R, [FORMAT], PHASE

d. Perform the following key strokesto do a pass loss calibration.

[CAL], CALIBRATE MENU, RESPONSE, THRU, DONE:RESPONSE

e. Set the Step Attenuator to 10 dB.

f. Press [MENU], POWER, [2], [x1] to change the output power from -8 dBm to +2 dBm.

g. Perform the following key strokes for a single sweep measurement.

[MENU], TRIGGER MENU, SINGLE

h. Rotate the RPG knob, and read the phase measurement result at 3 MHz and the magnitude ratio measurement result at 50 MHz. Then record the these results on the Calculation Sheet.

i. Set the Step Attenuator to 20 dB.

j. Press (MENU), POWER, (1), (2), (x1) to change the output power from +2 dBm to +12 dBm.

k. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

l. Rotate the RPG knob, and read the phase measurement result at 3 MHz and the magnitude ratio measurement result at 50 MHz. Then record these results on the Calculation Sheet.

m. Press (MENU), POWER, (-), (8), (x1) to change the output power from +12 dBm to -8 dBm.

n. Change the cable connection as shown in Figure 2-24.

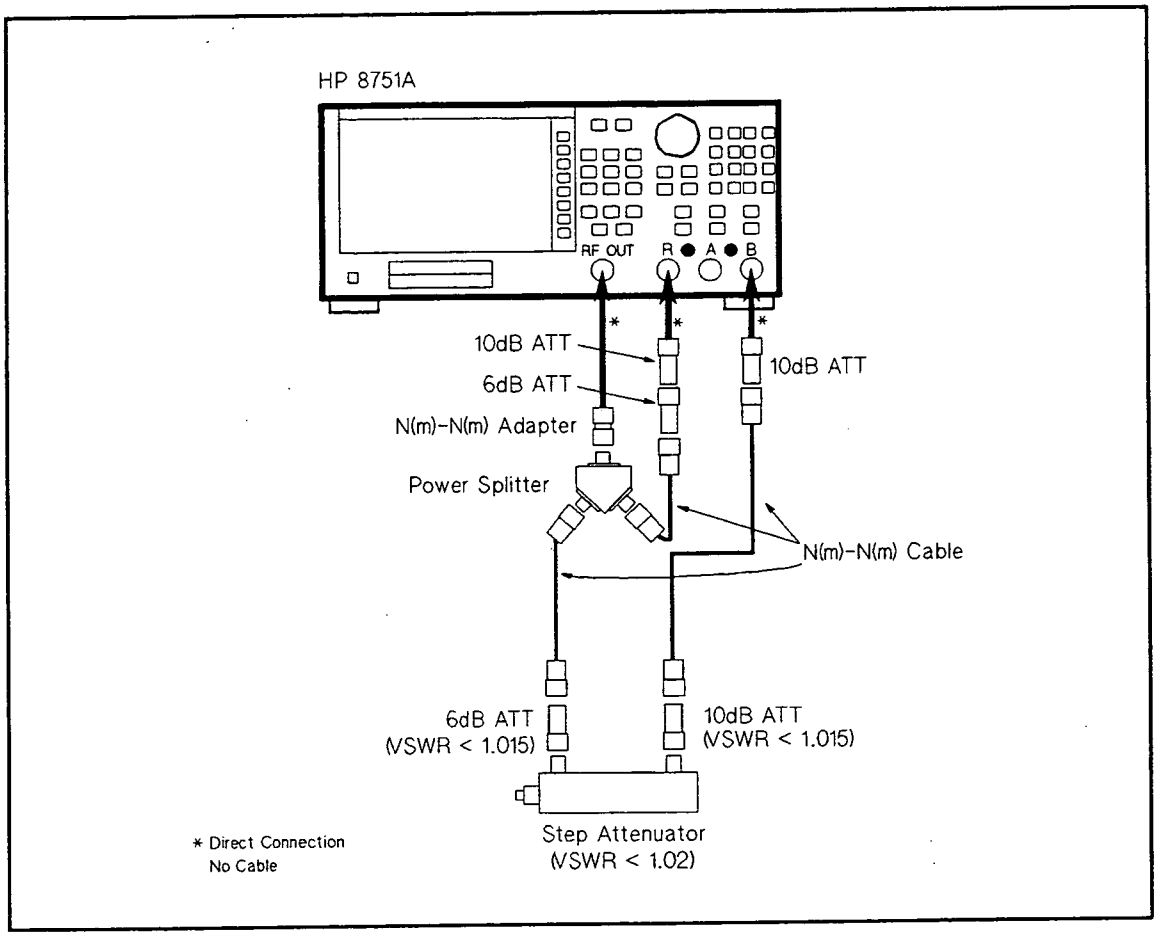


Figure 2-24. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 4

o. Change the Step Attenuator to 0 dB.

p. Perform the following key strokes to do a pass loss calibration.

(CAL), CALIBRATE MENU, RESPONSE, THRU, DONE:RESPONSE

q. Set the Step Attenuator to 10 dB.

r. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

s. Rotate the RPG knob, and read the phase measurement result at 3 MHz and the magnitude ratio measurement result at 50 MHz. Then record these results on the Calculation Sheet.

t. Set the Step Attenuator from 20 dB to 80 dB in 10 dB steps, and repeat steps r and s in step 3 for every attenuation setting.

4. *—A/B Dynamic Accuracy Test (Magnitude Ratio (50 MHz) and Phase (3 MHz))—*

a. Connect the test equipment as shown in Figure 2-25.

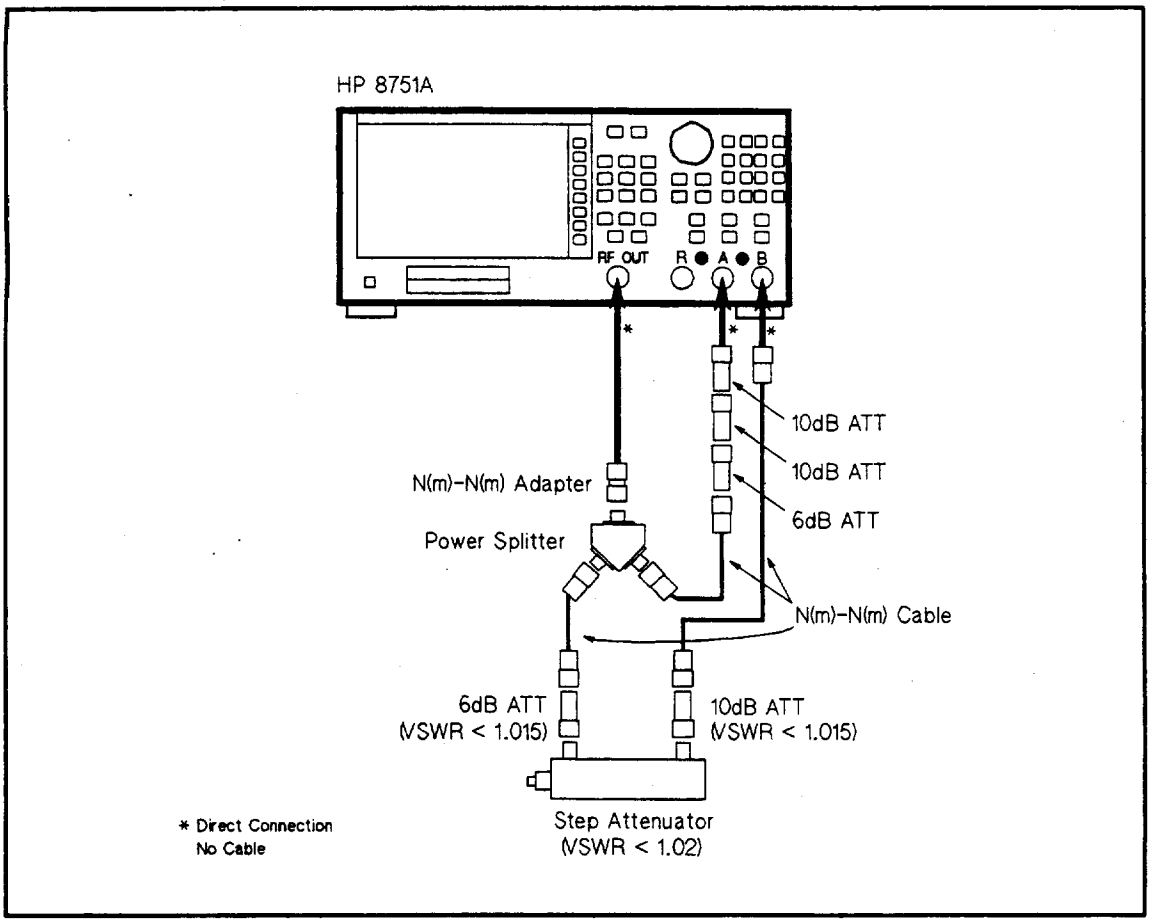


Figure 2-25. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 5

b. Set the Step Attenuator to 0 dB.

c. Change the HP 8751A control settings as follows:

Control Settings	Key Strokes
CH1: A/B, LOG MAG	CH 1, MEAS, A/B, FORMAT, LOG MAG
CH2: A/B, PHASE	CH 2, MEAS, A/B, FORMAT, PHASE

d. Perform the following key strokes to do a pass loss calibration.

CH 1, CAL, CALIBRATE MENU, RESPONSE, THRU, DONE:RESPONSE

e. Set the Step Attenuator to 10 dB.

f. Press MENU, POWER, 2, x1 to change the output power from -8 dBm to +2 dBm.

g. Perform the following key strokes for a single sweep measurement.

MENU, TRIGGER MENU, SINGLE

h. Rotate the RPG knob, and read the phase measurement result at 3 MHz and the magnitude ratio measurement result at 50 MHz. Then record these results on the Calculation Sheet.

i. Set the Step Attenuator to 20 dB.

j. Press (MENU), POWER, (1), (2), (x1) to change the output power from +2 dBm to +12 dBm.

k. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

l. Rotate the RPG knob, and read the phase measurement result at 3 MHz and the magnitude ratio measurement result at 50 MHz. Then record these results on the Calculation Sheet.

m. Press (MENU), POWER, (-), (8), (x1) to change the source power from +12 dBm to -8 dBm.

n. Change the cable connection as shown in Figure 2-26.

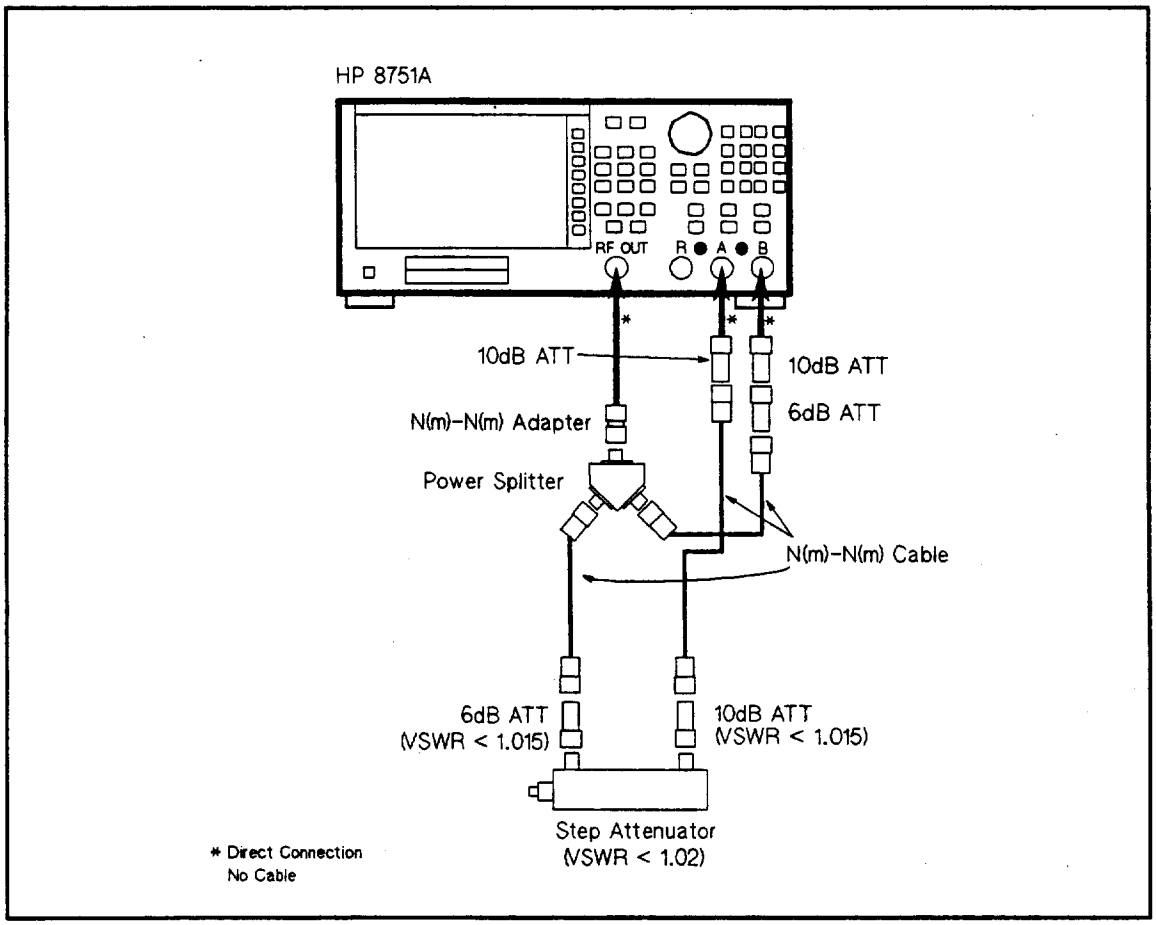


Figure 2-26. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 6

o. Change the Step Attenuator to 0 dB.

p. Perform the following key strokes to do a pass loss calibration.

(CAL), CALIBRATE MENU, RESPONSE, THRU, DONE:RESPONSE

q. Set the Step Attenuator to 10 dB.

r. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

s. Rotate the RPG knob, and read the phase measurement result at 3 MHz and the magnitude ratio measurement result at 50 MHz. Then record these results on the Calculation Sheet.

t. Set the Step Attenuator from 20 dB to 80 dB in 10 dB steps, and repeat steps r and s in step 4 for every attenuation setting.

5. *—A/R Dynamic Accuracy at the Other Frequencies Test—*

a. Connect the test equipment as shown in Figure 2-27.

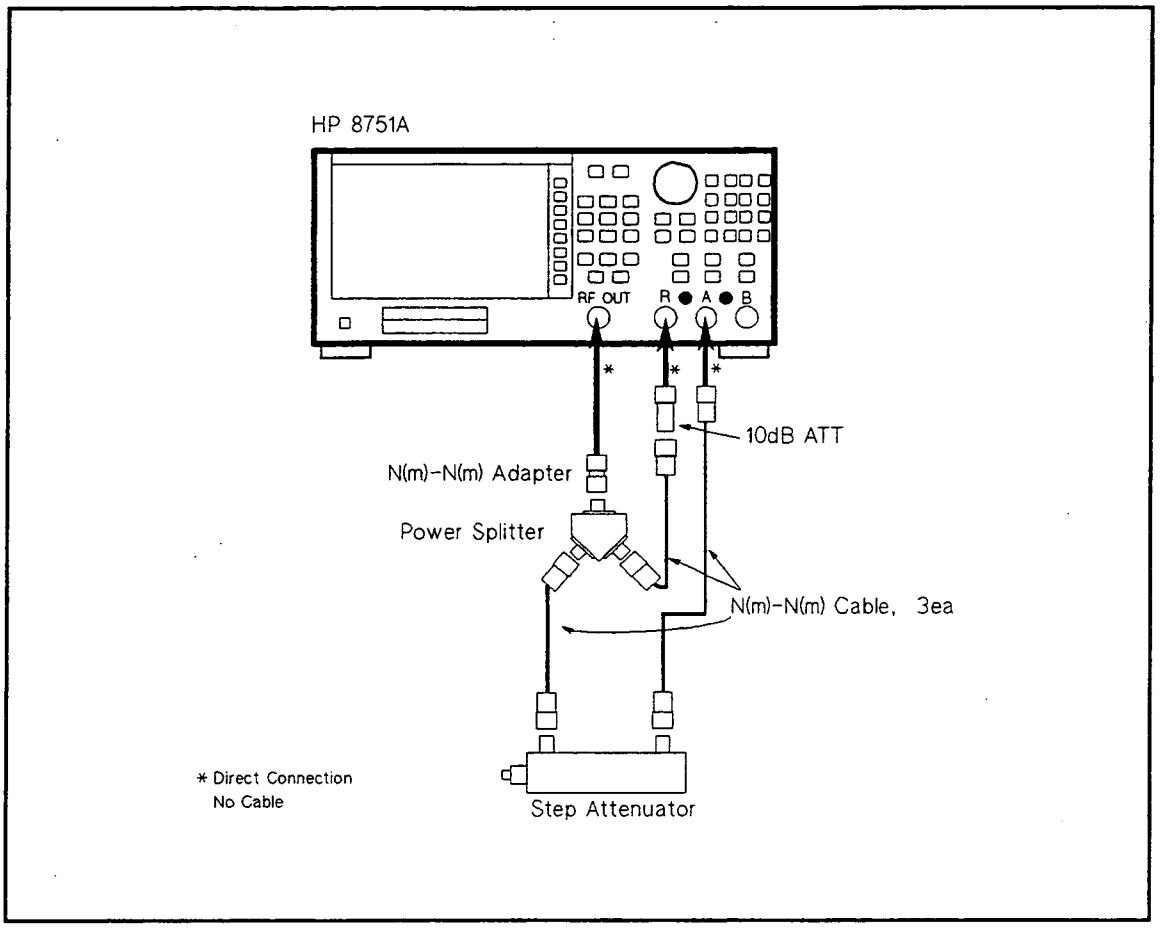


Figure 2-27. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 7

b. Set the Step Attenuator to 10 dB.

c. Set the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
CH1: A/R, LOG MAG	[CH 1], [MEAS], A/R, [FORMAT], LOG MAG
CH2: A/R, PHASE	[CH 2], [MEAS], A/R, [FORMAT], PHASE
Dual Channel: ON	[DISPLAY], DUAL CHAN on/OFF
CENTER Freq. = 1 kHz	[CENTER], [1], [k/m]
SPAN Freq. = 0 Hz	[SPAN], [0], [x1]
Number of Points = 2	[MENU], NUMBER of POINTS, [2], [x1]
IF BW: 20 Hz	[AVG], IF BW, [2], [0], [x1]
Source Power = -10 dBm	[MENU], POWER, [-], [1], [0], [x1]

Markers: Discrete, Coupled	(MKR), MARKER MODE MENU, MARKERS:DISCRETE, MARKERS:COUPLED

d. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

e. Perform the following key stroke.

(CH 1), (DISPLAY), DEFINE TRACE, DATA -> MEM, DATA/MEM, (CH 2), DATA -> MEM, DATA/MEM.

f. Press (MENU), POWER, (0), (x1) to change the output power from -10 dBm to 0 dBm.

g. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

h. Record the Magnitude Ratio/Phase reading values on the Calculation Sheet.

i. Press (MENU), POWER, (-), (1), (0), (x1) to change the output power from 0 dBm to -10 dBm.

j. Set the Step Attenuator to 0 dB.

k. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

l. Perform the following key strokes.

(CH 1), (DISPLAY), DEFINE TRACE, DATA -> MEM, (CH 2), DATA -> MEM

m. Press (MENU), POWER, (0), (x1) to change the output power from -10 dBm to 0 dBm.

n. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

o. Record the Magnitude Ratio/Phase reading values on the Calculation Sheet.

p. Change the HP 8751A control settings as follows:

Control Settings	**Key Strokes**
START Freq. = 1 MHz	(START), (1), (M/u)
STOP Freq. = 50 MHz	(STOP), (5), (0), (M/u)
Source Power = -4 dBm	(MENU), POWER, (-), (4), (x1)

q. Change the Step Attenuator to 10 dB.

r. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

s. Perform the following key stroke.

(CH 1), (DISPLAY), DEFINE TRACE, DATA -> MEM, DATA/MEM, (CH 2), DATA -> MEM, DATA/MEM.

t. Press (MENU), POWER, (6), (x1) to change the output power from -4 dBm to +6 dBm.

u. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

v. Rotate the RPG knob, and record the Magnitude Ratio/Phase reading values for each frequency on the Calculation Sheet.

w. Press (MENU), POWER, (-), (4), (x1) to change the output power from +6 dBm to -4 dBm.

x. Set the Step Attenuator to 0 dB.

y. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

z. Perform the following key strokes.

(CH 1), (DISPLAY), DEFINE TRACE, DATA -> MEM, (CH 2), DATA -> MEM

aa. Press (MENU), POWER, (6), (x1) to change the output power from -4 dBm to +6 dBm.

bb. Perform the following key strokes for a single sweep measurement.

(MENU), TRIGGER MENU, SINGLE

cc. Rotate the RPG knob, and record the Magnitude Ratio/Phase reading values for each frequency on the Calculation Sheet.

dd. Change the HP 8751A control settings as follows:

Control Settings	**Key Stroke**
START Freq. = 100 MHz	(START), (1), (0), (0), (M/u)
STOP Freq. = 500 MHz	(STOP), (5), (0), (0), (M/u)
Source Power = -4 dBm	(MENU), POWER, (-), (4), (x1)
Number of Points: 5	(MENU), NUMBER of POINTS, (5), (x1)

ee. Set the Step Attenuator to 10 dB.

ff. Repeat the steps r through cc in step 5.

6. *—B/R Dynamic Accuracy at the Other Frequencies Test—*

a. Change the HP 8751A connection as shown in Figure 2-28.

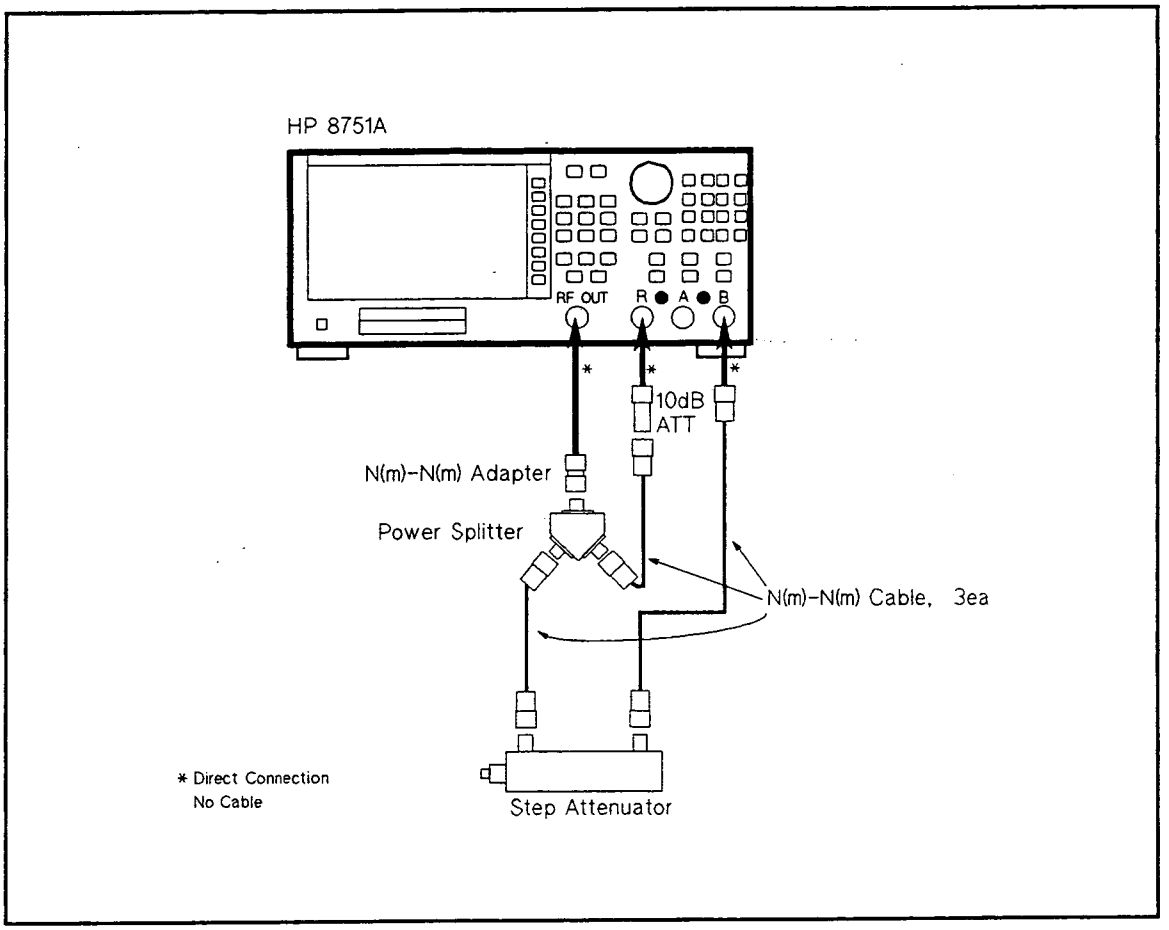


Figure 2-28. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 8

b. Change the HP 8751A control settings as follows:

Control Settings	Key Strokes
CH1: B/R, LOG MAG	CH 1, MEAS, B/R, FORMAT, LOG MAG
CH2: B/R, PHASE	CH 2, MEAS, B/R, FORMAT, PHASE
CENTER Freq. = 1 kHz	CENTER, 1, k/m
SPAN Freq. = 0 Hz	SPAN, 0, x1
Source Power = -10 dBm	MENU, POWER, -, 1, 0, x1
Number of Points: 2	MENU, NUMBER of POINTS, 2, x1

c. Set the Step Attenuator to 10 dB.

d. Repeat the steps d through ff in step 5.

7. *—A/B Dynamic Accuracy at the Other Frequencies Test—*

a. Change the HP 8751A connection as shown in Figure 2-29.

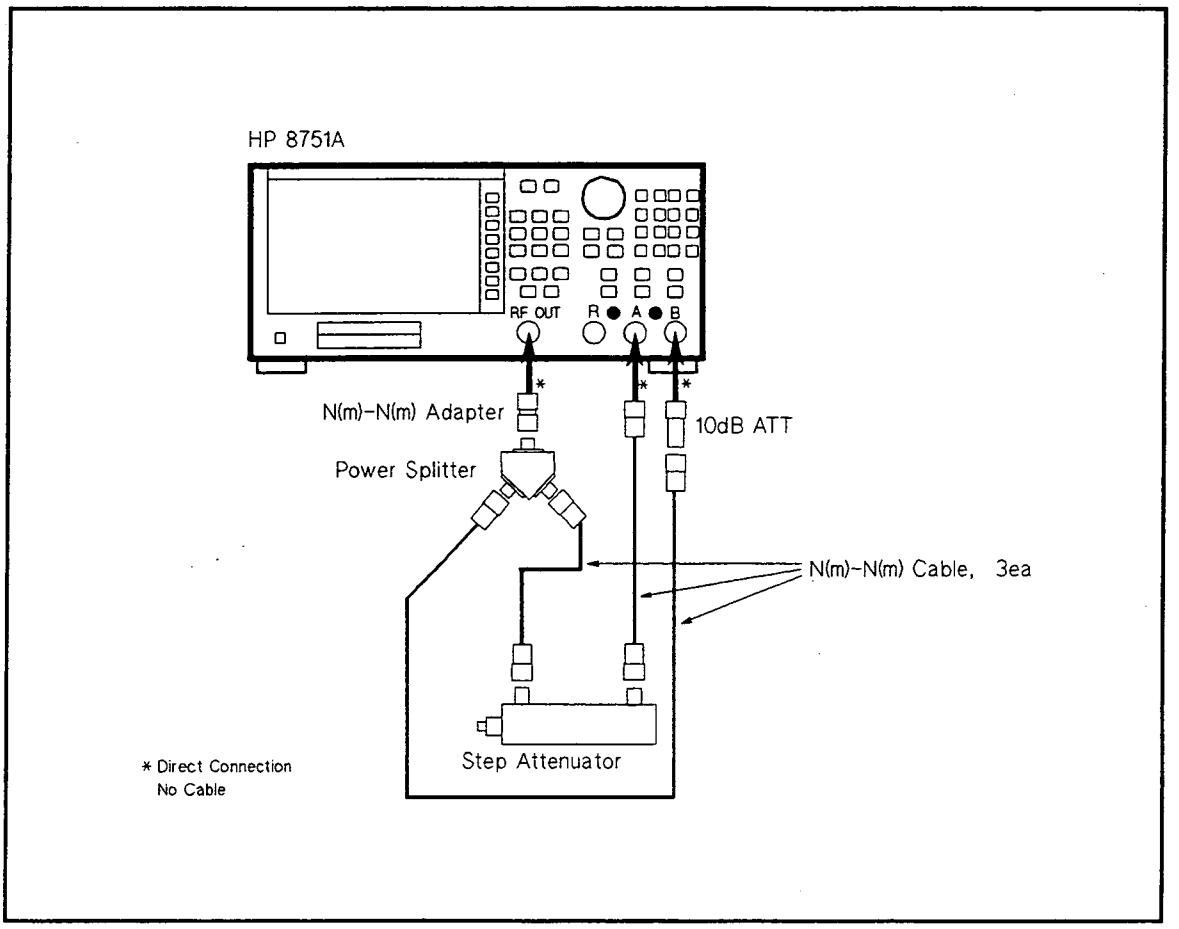


Figure 2-29. Magnitude Ratio/Phase Dynamic Accuracy Test Setup 9

b. Change the HP 8751A control settings as follows:

Control Settings	Key Stroke
CH1: A/B, LOG MAG	[CH 1], [MEAS], A/B, [FORMAT], LOG MAG
CH2: A/B, PHASE	[CH 2], [MEAS], A/B, [FORMAT], PHASE
CENTER Freq. = 1 kHz	[CENTER], [1], [k/m]
SPAN Freq. = 0 Hz	[SPAN], [0], [x1]
Source Power = -10 dBm	[MENU], POWER, [-], [1], [0], [x1]
Number of Points: 2	[MENU], NUMBER of POINTS, [2], [x1]

c. Set the Step Attenuator to 10 dB.

d. Repeat the steps d through ff in step 5.

MAGNITUDE RATIO FREQUENCY RESPONSE TEST

This test checks the magnitude ratio accuracy for each pair of inputs by measuring the peak-to-peak variation of the ratioed trace.

Specification

(At 23 ± 5°C, same ATT for both input ports, -10 dBm relative to Input Range)

5 Hz ≤ Freq. ≤ 100 MHz	± 0.5 dB
100 MHz < Freq. ≤ 300 MHz	± 1.0 dB
300 MHz < Freq. ≤ 500 MHz	± 1.5 dB

Test Equipment

Three Way Power Splitter	HP 11850C
50 Ω type-N RF cable set	HP 11851B

Procedure

1. Connect the equipment as shown in Figure 2-30.

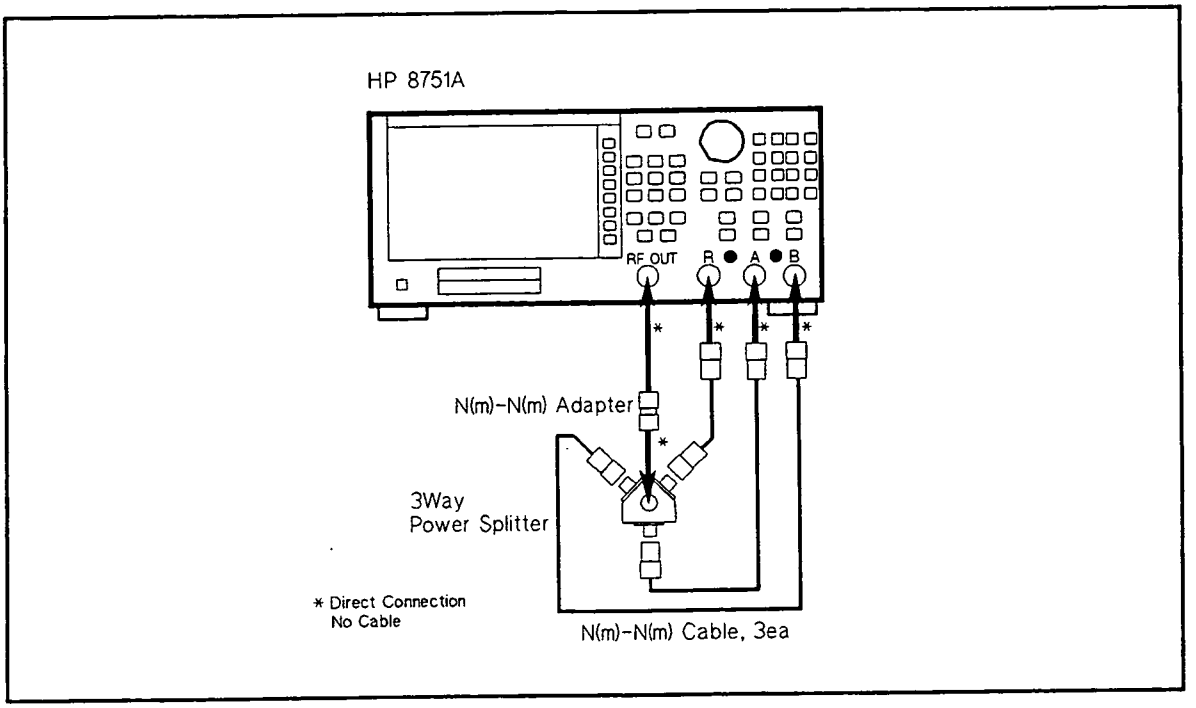


Figure 2-30. Magnitude Ratio Frequency Response Test Setup

2. Set up the HP 8751A as follows.

Control Settings	Key Strokes
PRESET	(PRESET)
Meas. Config.: A/R	(MEAS), A/R
Source Power = -0.5 dBm	(MEAS), POWER, (-), (.), (5), (x1)
IF BW: 2 Hz	(AVG), IF BW, (2), (x1)
Scale: 0.5 dB/div	(SCALE REF), SCALE/DIV, (.), (5), (x1).

3. Store the measurement data using the following key stroke.

   (MKR FCTN), MARKER -> REFERENCE, (DISPLAY), DEFINE TRACE, DATA -> MEM

4. Reverse R and A cable connections on the HP 8751A input ports.

5. Press the (DISPLAY), DEFINE TRACE, DATA and MEMORY. Visually average the two traces: imagine a trace directly between the two traces. (If both traces are not completely visible, change the scales as required.)

   a. Rotate the RPG knob, and record the maximum "averaged" power deviation from 5 Hz to 100 MHz on the Performance Test Record.

   b. Rotate the RPG knob, and record the maximum "averaged" power deviation from 100 MHz to 300 MHz on the Performance Test Record.

   c. Rotate the RPG knob, and record the maximum "averaged" power deviation from 300 MHz to 500 MHz on the Performance Test Record.

6. Press DISPLAY: DATA.

7. Change the HP 8751A control settings as follows:

Control Settings	Key Strokes
Meas. Config.: B/R	(MEAS), B/R

8. Repeat the steps 3 through 6, except reverse the B and R input cable connections after storing the trace.

9. Press DISPLAY: DATA.

10. Change the HP 8751A control settings as follows:

Control Settings	Key Strokes
Meas. Config.: A/B	(MEAS), A/B

11. Repeat the steps 3 through 6, except reverse the B and R input cable connections after storing the trace.

PHASE FREQUENCY RESPONSE TEST

This test checks the phase tracking frequency response, measured as deviation from linear phase.

Specification

(At 23 ± 5°C, the same ATT setting for both input ports, -10 dBm relative to Input Range)

5 Hz ≤ Freq. ≤ 100 MHz:	± 2.5 degree
100 MHz < Freq. ≤ 300 MHz:	± 5.0 degree
300 MHz < Freq. ≤ 500 MHz :	± 10.0 degree

Test Equipment

Three Way Power Splitter	HP 11850C
N(m)-N(m) Adapter	PN 1250-1475
50 Ω type-N RF cable set	HP 11851B

Procedure

1. Connect the equipment as shown in Figure 2-31.

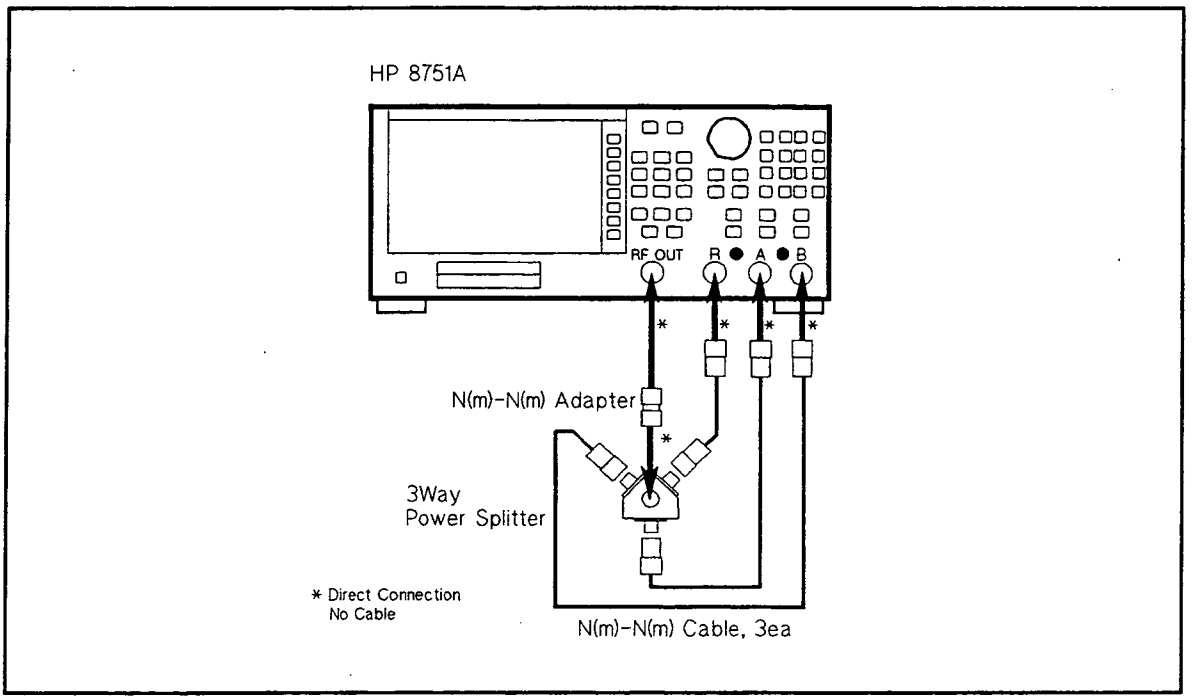


Figure 2-31. Phase Frequency Response Test Setup

2. Set up the HP 8751A as follows:

Control Settings	Key Strokes
PRESET	[PRESET]
Meas. Config. : A/R	[MEAS], A/R
Display Format: Phase	[FORMAT], PHASE
Source Power= -0.5 dBm	[MENU], POWER, [-], [.], [5], [x1]
IF BW: AUTO	[AVG], IF BW, [2], [x1]
Marker Statistics ON	[MKR FCTN], STATISTICS on/OFF
Scale: 2.5°/div	[SCALE REF], [2], [.], [5], [x1]

3. Press [SCALE REF], ELEC DELAY MENU, ELECTRICAL DELAY and turn the RPG knob or press [↑], [↓] to vary the electrical delay until the standard deviation value as a marker statistic (s.dev) is minimum as possible.

4. Press PHASE OFFSET, and enter the mean value as a marker statistic (mean).

5. Perform the following key strokes for a single sweep measurement.

   [MENU], TRIGGER MENU, SINGLE

6. Perform the following key strokes to set the marker search range from 5 Hz to 100 MHz.

   [MKR], ACTIVE MARKER, MARKER 1, [5], [x1], ACTIVE MARKER, MARKER 2, [1], [0], [0], [M/u], △ MODE MENU, △ REF MARKER, △ REF = 1, [MKR FCTN], SEARCH RANGE, SEARCH RNG STORE, PART SRCH on/OFF

7. Move the marker to the maximum value and the minimum value using the following key strokes. Compare the two values, and record the larger one in the Performance Test Record.

   [MKR], △ MODE MENU, △ MODE OFF, [MKR FCTN], MKR SEARCH, MAX, MIN

8. Press [MKR], △ MODE MENU, △ RF MARKER, △ RF = 1.

9. Perform the following key strokes to set the marker search range from 100 MHz to 300 MHz.

   [MKR], ACTIVE MARKER, MARKER 1, [9], [9], [.], [9], [9], [9], [9], [9], [5], [M/u], [MKR], ACTIVE MARKER, MARKER 2, [2], [0], [0], [M/u], [MKR FCTN], SEARCH RANGE, SEARCH RNG STORE

10. Move the marker to the maximum value and the minimum value using the following key strokes. Compare the two values, and record the larger one in the Performance Test Record.

    [MKR], △ MODE MENU, △ MODE OFF, [MKR FCTN], MKR SEARCH, MAX, MIN

11. Press [MKR], △ MODE MENU, △ RF MARKER, △ RF = 1.

12. Perform the following key strokes to set the marker search range from 300 MHz to 500 MHz.

(MKR), ACTIVE MARKER, MARKER 1, (2), (0), (0), (M/u), (MKR), ACTIVE MARKER, MARKER 2, (3), (0), (0), (M/u), (MKR FCTN), SEARCH RANGE, SEARCH RNG STORE

13. Move the marker to the maximum value and the minimum value using the following key strokes. Compare the two values, and record the larger one in the Performance Test Record.

    (MKR), △ MODE MENU, △ MODE OFF, (MKR FCTN), MKR SEARCH, MAX, MIN

14. Press (MKR), △ MODE MENU, △ RF MARKER, △ RF = 1.

15. Change the HP 8751A control settings for B/R Phase:

Control Settings	Key Strokes
Meas. Config.: B/R, Phase	(MEAS), B/R, (FORMAT), PHASE
Trigger Mode: Continuous	(MENU), TRIGGER MENU, CONTINUOUS

16. Repeat steps 3 through 14.

17. Change the HP 8751A control settings for A/B Phase:

Control Settings	Key Strokes
Meas. Config. : A/B, Phase	(MEAS), A/B, (FORMAT), PHASE
Trigger Mode; Continuous	(MENU), TRIGGER MENU, CONTINUOUS

18. Repeat steps 3 through 14.

DC MEASUREMENT RANGE AND ACCURACY TEST

This test checks the HP 8751A DC measurement range and accuracy for input-B.

Specification

Range:	±2 Vdc
Accuracy:	±(0.5% + 5mV)

Test Equipment

Universal Source	HP 3245A
BNC (m)-BNC(m) Cable, 61 cm	PN 8120-1840
N(m)-BNC(f) Adapter	PN 1250-0780

Procedure

1. Connect the equipment as shown in Figure 2-32.

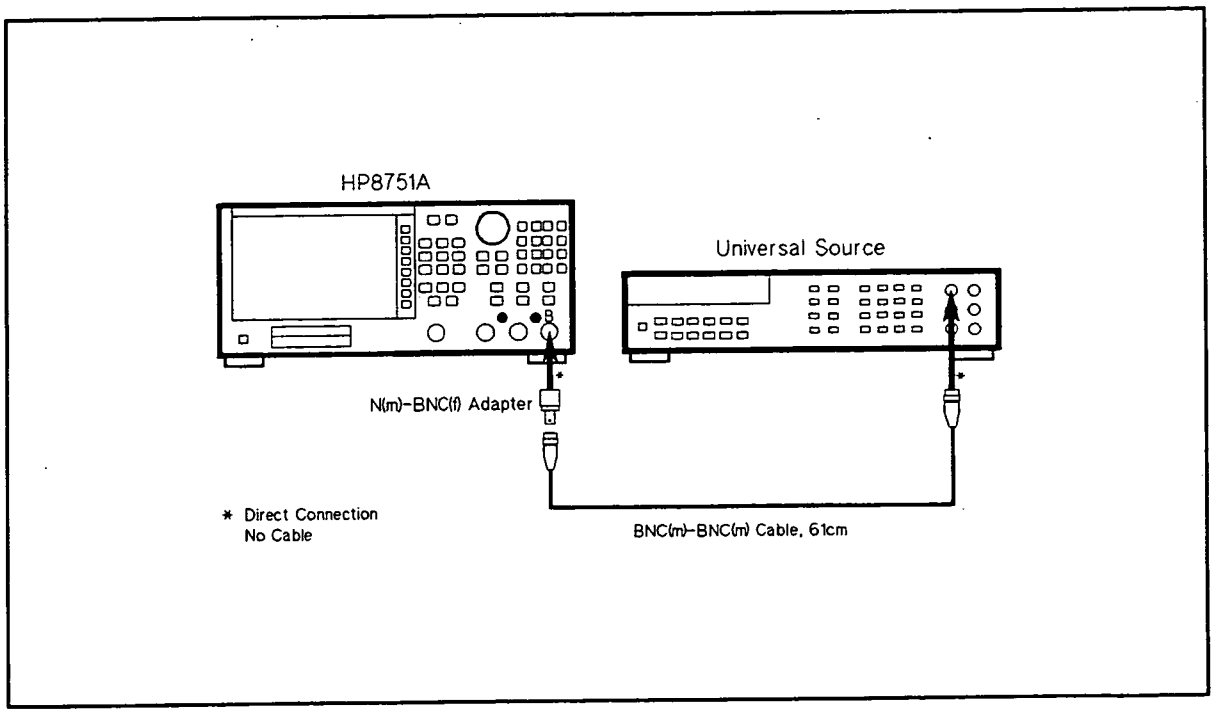


Figure 2-32. DC Measurement Range and Accuracy Test Setup

2. Set up the HP 8751A as follows.

Control Settings	Key Strokes
PRESET	[PRESET]
Meas. Config.: Bdc	[MEAS], S-PARAMTERS, Bdc
Display Format: REAL	[FORMAT], MORE, REAL
Marker Function: ON	[MKR FCTN]

3. Set the universal source as follows.

Output Channel:	Channel A
Output Impedance:	0 Ω
Output Mode:	DCV
Resolution:	High Resolution Mode
Output Voltage:	0 V

4. Record the HP 8751A reading value on the Performance Test Record.
5. Change the universal source's output voltage to 2 V.
6. Record the HP 8751A reading value on the Performance Test Record.
7. Change the universal source's output voltage to -2 V.
8. Record the HP 8751A reading value on the Performance Test Record.

CALCULATION SHEET

Harmonics Test

HP 8751A Center Frequency	Spectrum Analyzer Frequency	Spectrum Analyzer Reading	Test Result [-a+b]
100 Hz	100 Hz	a = _____ dBm	
	200 Hz	b = _____ dBm	_____ dBc
	300 Hz	b = _____ dBm	_____ dBc
10 kHz	10 kHz	a = _____ dBm	
	20 kHz	b = _____ dBm	_____ dBc
	30 kHz	b = _____ dBm	_____ dBc
500 kHz	500 kHz	a = _____ dBm	
	1 MHz	b = _____ dBm	_____ dBc
	1.5 MHz	b = _____ dBm	_____ dBc
10 MHz	10 MHz	a = _____ dBm	
	20 MHz	b = _____ dBm	_____ dBc
	30 MHz	b = _____ dBm	_____ dBc
100 MHz	100 MHz	a = _____ dBm	
	200 MHz	b = _____ dBm	_____ dBc
	300 MHz	b = _____ dBm	_____ dBc
300 MHz	300 MHz	a = _____ dBm	
	600 MHz	b = _____ dBm	_____ dBc
	900 MHz	b = _____ dBm	_____ dBc
500 MHz	500 MHz	a = _____ dBm	
	1000 MHz	b = _____ dBm	_____ dBc
	1500 MHz	b = _____ dBm	_____ dBc

Non-Harmonic Sprious Test

HP 8751A Center Frequency	Spectrum Analyzer Frequency	Spectrum Analyzer Reading	Test Result [-a+b]
493.7625 MHz	f1 = _____	a = _____ dBm	
	f1 + 205 Hz = _____	b = _____ dBm	_____ dBc
493.76274125 MHz	f2 = _____	a = _____ dBm	
	f2 + 550 Hz = _____	b = _____ dBm	_____ dBc
493.7649125 MHz	f3 = _____	a = _____ dBm	
	f3 + 5.5 kHz = _____	b = _____ dBm	_____ dBc
493.786625 MHz	f4 = _____	a = _____ dBm	
	f4 + 55 kHz = _____	b = _____ dBm	_____ dBc
426 MHz	426 MHz	a = _____ dBm	
	424 MHz	b = _____ dBm	_____ dBc

Phase Noise Test

HP 8751A Center Frequency	Spectrum Analyzer Frequency		Spectrum Analyzer Reading	Test Result [-a+b]
4 MHz	4 MHz	a =	_____ dBm	
	3.98 MHz	b =	_____ dBm	_____
	4.02 MHz	b =	_____ dBm	_____
249 MHz	249 MHz	a =	_____ dBm	
	248.98 MHz	b =	_____ dBm	_____
	249.02 MHz	b =	_____ dBm	_____
498.5875 MHz	498.5875 MHz	a =	_____ dBm	
	498.5675 MHz	b =	_____ dBm	_____
	498.6075 MHz	b =	_____ dBm	_____

Source Level Linearity/Flatness Test

HP 8751A Center Frequency	HP 3458A Reading [a]	Test Result [a-d]
5 Hz	_____ dBm	_____ dB
50 Hz	_____ dBm	_____ dB
1 kHz	_____ dBm	_____ dB
10 kHz	_____ dBm	_____ dB
100 kHz	_____ dBm	_____ dB

HP 8751A Center Frequency		HP Power Meter Reading [a]	Test Result [a-d]
1 MHz		_____ dBm	_____ dB
10 MHz		_____ dBm	_____ dB
50 MHz	d =	_____ dBm	_____ dB
100 MHz		_____ dBm	_____ dB
200 MHz		_____ dBm	_____ dB
300 MHz		_____ dBm	_____ dB
400 MHz		_____ dBm	_____ dB
500 MHz		_____ dBm	_____ dB

Non Sweep Power Linearity Test

HP 8482A Power Sensor

Source Power [a]		Power Meter Reading [b]		Test Result [-a+b-d]	
-10 dBm	c =	_____	dBm	_____	dB
0 dBm	d =	_____	dBm		
+10 dBm		_____	dBm	_____	dB
+15 dBm		_____	dBm	_____	dB

HP 8481D Power Sensor

Source Power [a]		Power Meter Reading [b]		Test Result [-a+b+c-d-e]	
-10 dBm	e =	_____	dBm		
-15 dBm		_____	dBm	_____	dB
-20 dBm		_____	dBm	_____	dB
-25 dBm		_____	dBm	_____	dB
-30 dBm		_____	dBm	_____	dB
-35 dBm		_____	dBm	_____	dB
-40 dBm		_____	dBm	_____	dB
-45 dBm		_____	dBm	_____	dB
-50 dBm		_____	dBm	_____	dB

Power Sweep Linearity Test

CW FREQUENCY = 500 kHz

Output Level	Power Meter Reading
-15 dBm	a = _____ dBm
-20 dBm	b = _____ dBm
-25 dBm	c = _____ dBm
-30 dBm	d = _____ dBm
-35 dBm	e = _____ dBm
-40 dBm	f = _____ dBm
-45 dBm	g = _____ dBm
-50 dBm	h = _____ dBm

STOP Power	Output Level	Test Result
-15 dBm	-20 dBm	- a + b + 5 = _____ dB
	-25 dBm	- a + c + 10 = _____ dB
	-30 dBm	- a + d + 15 = _____ dB
	-35 dBm	- a + e + 20 = _____ dB
	-40 dBm	- a + f + 25 = _____ dB
	-45 dBm	- a + g + 30 = _____ dB
	-50 dBm	- a + h + 35 = _____ dB
-20 dBm	-25 dBm	- b + c + 5 = _____ dB
	-30 dBm	- b + d + 10 = _____ dB
	-35 dBm	- b + e + 15 = _____ dB
	-40 dBm	- b + f + 20 = _____ dB
	-45 dBm	- b + g + 25 = _____ dB
	-50 dBm	- b + h + 30 = _____ dB
-25 dBm	-30 dBm	- c + d + 5 = _____ dB
	-35 dBm	- c + e + 10 = _____ dB
	-40 dBm	- c + f + 15 = _____ dB
	-45 dBm	- c + g + 20 = _____ dB
	-50 dBm	- c + h + 25 = _____ dB
-30 dBm	-35 dBm	- d + e + 5 = _____ dB
	-40 dBm	- d + f + 10 = _____ dB
	-45 dBm	- d + g + 15 = _____ dB
	-50 dBm	- d + h + 20 = _____ dB
-35 dBm	-40 dBm	- e + f + 5 = _____ dB
	-45 dBm	- e + g + 10 = _____ dB
	-50 dBm	- e + h + 15 = _____ dB
-40 dBm	-45 dBm	- f + g + 5 = _____ dB
	-50 dBm	- f + h + 10 = _____ dB
-45 dBm	-50 dBm	- g + h + 5 = _____ dB

CW FREQUENCY = 1 MHz

Output Level	Power Meter Reading
-15 dBm	a = _____ dBm
-20 dBm	b = _____ dBm
-25 dBm	c = _____ dBm
-30 dBm	d = _____ dBm
-35 dBm	e = _____ dBm
-40 dBm	f = _____ dBm
-45 dBm	g = _____ dBm
-50 dBm	h = _____ dBm

STOP Power	Output Level	Test Result
-15 dBm	-20 dBm	- a + b + 5 = _____ dB
	-25 dBm	- a + c + 10 = _____ dB
	-30 dBm	- a + d + 15 = _____ dB
	-35 dBm	- a + e + 20 = _____ dB
	-40 dBm	- a + f + 25 = _____ dB
	-45 dBm	- a + g + 30 = _____ dB
	-50 dBm	- a + h + 35 = _____ dB
-20 dBm	-25 dBm	- b + c + 5 = _____ dB
	-30 dBm	- b + d + 10 = _____ dB
	-35 dBm	- b + e + 15 = _____ dB
	-40 dBm	- b + f + 20 = _____ dB
	-45 dBm	- b + g + 25 = _____ dB
	-50 dBm	- b + h + 30 = _____ dB
-25 dBm	-30 dBm	- c + d + 5 = _____ dB
	-35 dBm	- c + e + 10 = _____ dB
	-40 dBm	- c + f + 15 = _____ dB
	-45 dBm	- c + g + 20 = _____ dB
	-50 dBm	- c + h + 25 = _____ dB
-30 dBm	-35 dBm	- d + e + 5 = _____ dB
	-40 dBm	- d + f + 10 = _____ dB
	-45 dBm	- d + g + 15 = _____ dB
	-50 dBm	- d + h + 20 = _____ dB
-35 dBm	-40 dBm	- e + f + 5 = _____ dB
	-45 dBm	- e + g + 10 = _____ dB
	-50 dBm	- e + h + 15 = _____ dB
-40 dBm	-45 dBm	- f + g + 5 = _____ dB
	-50 dBm	- f + h + 10 = _____ dB
-45 dBm	-50 dBm	- g + h + 5 = _____ dB

CW FREQUENCY = 10 MHz

Output Level	Power Meter Reading
-15 dBm	a = _____ dBm
-20 dBm	b = _____ dBm
-25 dBm	c = _____ dBm
-30 dBm	d = _____ dBm
-35 dBm	e = _____ dBm
-40 dBm	f = _____ dBm
-45 dBm	g = _____ dBm
-50 dBm	h = _____ dBm

STOP Power	Output Level	Test Result
-15 dBm	-20 dBm	- a + b + 5 = _____ dB
	-25 dBm	- a + c + 10 = _____ dB
	-30 dBm	- a + d + 15 = _____ dB
	-35 dBm	- a + e + 20 = _____ dB
	-40 dBm	- a + f + 25 = _____ dB
	-45 dBm	- a + g + 30 = _____ dB
	-50 dBm	- a + h + 35 = _____ dB
-20 dBm	-25 dBm	- b + c + 5 = _____ dB
	-30 dBm	- b + d + 10 = _____ dB
	-35 dBm	- b + e + 15 = _____ dB
	-40 dBm	- b + f + 20 = _____ dB
	-45 dBm	- b + g + 25 = _____ dB
	-50 dBm	- b + h + 30 = _____ dB
-25 dBm	-30 dBm	- c + d + 5 = _____ dB
	-35 dBm	- c + e + 10 = _____ dB
	-40 dBm	- c + f + 15 = _____ dB
	-45 dBm	- c + g + 20 = _____ dB
	-50 dBm	- c + h + 25 = _____ dB
-30 dBm	-35 dBm	- d + e + 5 = _____ dB
	-40 dBm	- d + f + 10 = _____ dB
	-45 dBm	- d + g + 15 = _____ dB
	-50 dBm	- d + h + 20 = _____ dB
-35 dBm	-40 dBm	- e + f + 5 = _____ dB
	-45 dBm	- e + g + 10 = _____ dB
	-50 dBm	- e + h + 15 = _____ dB
-40 dBm	-45 dBm	- f + g + 5 = _____ dB
	-50 dBm	- f + h + 10 = _____ dB
-45 dBm	-50 dBm	- g + h + 5 = _____ dB

CW FREQUENCY = 100 MHz

Output Level	Power Meter Reading
-15 dBm	a = _____ dBm
-20 dBm	b = _____ dBm
-25 dBm	c = _____ dBm
-30 dBm	d = _____ dBm
-35 dBm	e = _____ dBm
-40 dBm	f = _____ dBm
-45 dBm	g = _____ dBm
-50 dBm	h = _____ dBm

STOP Power	Output Level	Test Result
-15 dBm	-20 dBm	- a + b + 5 = _____ dB
	-25 dBm	- a + c + 10 = _____ dB
	-30 dBm	- a + d + 15 = _____ dB
	-35 dBm	- a + e + 20 = _____ dB
	-40 dBm	- a + f + 25 = _____ dB
	-45 dBm	- a + g + 30 = _____ dB
	-50 dBm	- a + h + 35 = _____ dB
-20 dBm	-25 dBm	- b + c + 5 = _____ dB
	-30 dBm	- b + d + 10 = _____ dB
	-35 dBm	- b + e + 15 = _____ dB
	-40 dBm	- b + f + 20 = _____ dB
	-45 dBm	- b + g + 25 = _____ dB
	-50 dBm	- b + h + 30 = _____ dB
-25 dBm	-30 dBm	- c + d + 5 = _____ dB
	-35 dBm	- c + e + 10 = _____ dB
	-40 dBm	- c + f + 15 = _____ dB
	-45 dBm	- c + g + 20 = _____ dB
	-50 dBm	- c + h + 25 = _____ dB
-30 dBm	-35 dBm	- d + e + 5 = _____ dB
	-40 dBm	- d + f + 10 = _____ dB
	-45 dBm	- d + g + 15 = _____ dB
	-50 dBm	- d + h + 20 = _____ dB
-35 dBm	-40 dBm	- e + f + 5 = _____ dB
	-45 dBm	- e + g + 10 = _____ dB
	-50 dBm	- e + h + 15 = _____ dB
-40 dBm	-45 dBm	- f + g + 5 = _____ dB
	-50 dBm	- f + h + 10 = _____ dB
-45 dBm	-50 dBm	- g + h + 5 = _____ dB

CW FREQUENCY = 300 MHz

Output Level	Power Meter Reading
-15 dBm	a = _____ dBm
-20 dBm	b = _____ dBm
-25 dBm	c = _____ dBm
-30 dBm	d = _____ dBm
-35 dBm	e = _____ dBm
-40 dBm	f = _____ dBm
-45 dBm	g = _____ dBm
-50 dBm	h = _____ dBm

STOP Power	Output Level	Test Result
-15 dBm	-20 dBm	- a + b + 5 = _____ dB
	-25 dBm	- a + c + 10 = _____ dB
	-30 dBm	- a + d + 15 = _____ dB
	-35 dBm	- a + e + 20 = _____ dB
	-40 dBm	- a + f + 25 = _____ dB
	-45 dBm	- a + g + 30 = _____ dB
	-50 dBm	- a + h + 35 = _____ dB
-20 dBm	-25 dBm	- b + c + 5 = _____ dB
	-30 dBm	- b + d + 10 = _____ dB
	-35 dBm	- b + e + 15 = _____ dB
	-40 dBm	- b + f + 20 = _____ dB
	-45 dBm	- b + g + 25 = _____ dB
	-50 dBm	- b + h + 30 = _____ dB
-25 dBm	-30 dBm	- c + d + 5 = _____ dB
	-35 dBm	- c + e + 10 = _____ dB
	-40 dBm	- c + f + 15 = _____ dB
	-45 dBm	- c + g + 20 = _____ dB
	-50 dBm	- c + h + 25 = _____ dB
-30 dBm	-35 dBm	- d + e + 5 = _____ dB
	-40 dBm	- d + f + 10 = _____ dB
	-45 dBm	- d + g + 15 = _____ dB
	-50 dBm	- d + h + 20 = _____ dB
-35 dBm	-40 dBm	- e + f + 5 = _____ dB
	-45 dBm	- e + g + 10 = _____ dB
	-50 dBm	- e + h + 15 = _____ dB
-40 dBm	-45 dBm	- f + g + 5 = _____ dB
	-50 dBm	- f + h + 10 = _____ dB
-45 dBm	-50 dBm	- g + h + 5 = _____ dB

CW FREQUENCY = 500 MHz

Output Level	Power Meter Reading
-15 dBm	a = _____ dBm
-20 dBm	b = _____ dBm
-25 dBm	c = _____ dBm
-30 dBm	d = _____ dBm
-35 dBm	e = _____ dBm
-40 dBm	f = _____ dBm
-45 dBm	g = _____ dBm
-50 dBm	h = _____ dBm

STOP Power	Output Level	Test Result
-15 dBm	-20 dBm	- a + b + 5 = _____ dB
	-25 dBm	- a + c + 10 = _____ dB
	-30 dBm	- a + d + 15 = _____ dB
	-35 dBm	- a + e + 20 = _____ dB
	-40 dBm	- a + f + 25 = _____ dB
	-45 dBm	- a + g + 30 = _____ dB
	-50 dBm	- a + h + 35 = _____ dB
-20 dBm	-25 dBm	- b + c + 5 = _____ dB
	-30 dBm	- b + d + 10 = _____ dB
	-35 dBm	- b + e + 15 = _____ dB
	-40 dBm	- b + f + 20 = _____ dB
	-45 dBm	- b + g + 25 = _____ dB
	-50 dBm	- b + h + 30 = _____ dB
-25 dBm	-30 dBm	- c + d + 5 = _____ dB
	-35 dBm	- c + e + 10 = _____ dB
	-40 dBm	- c + f + 15 = _____ dB
	-45 dBm	- c + g + 20 = _____ dB
	-50 dBm	- c + h + 25 = _____ dB
-30 dBm	-35 dBm	- d + e + 5 = _____ dB
	-40 dBm	- d + f + 10 = _____ dB
	-45 dBm	- d + g + 15 = _____ dB
	-50 dBm	- d + h + 20 = _____ dB
-35 dBm	-40 dBm	- e + f + 5 = _____ dB
	-45 dBm	- e + g + 10 = _____ dB
	-50 dBm	- e + h + 15 = _____ dB
-40 dBm	-45 dBm	- f + g + 5 = _____ dB
	-50 dBm	- f + h + 10 = _____ dB
-45 dBm	-50 dBm	- g + h + 5 = _____ dB

Absolute Amplitude Accuracy Test

Input-R

Frequency	3458A Reading [a]	8751A Reading [b]	Test Result [-a+b]
5 Hz	_____ dBm	_____ dBm	_____ dB
10 Hz	_____ dBm	_____ dBm	_____ dB
100 Hz	_____ dBm	_____ dBm	_____ dB
100 kHz	_____ dBm	_____ dBm	_____ dB
200 kHz	_____ dBm	_____ dBm	_____ dB
500 kHz	_____ dBm	_____ dBm	_____ dB

Frequency	Input Level	20 dB Pad Cal. Value [c]	Power Meter Reading [a]	8751A Reading [b]	Test Result [-c-a+b]
1 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
10 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
30 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
50 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
50 MHz	-10 dBm		_____ dBm	_____ dBm	_____ dB
100 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
300 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
500 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB

Input-A

Frequency	3458A Reading [a]	8751A Reading [b]	Test Result [-a+b]
5 Hz	_____ dBm	_____ dBm	_____ dB
10 Hz	_____ dBm	_____ dBm	_____ dB
100 Hz	_____ dBm	_____ dBm	_____ dB
100 kHz	_____ dBm	_____ dBm	_____ dB
200 kHz	_____ dBm	_____ dBm	_____ dB
500 kHz	_____ dBm	_____ dBm	_____ dB

Frequency	Input Level	20 dB Cal. Value [c]	Power Meter Reading [a]	8751A Reading [b]	Test Result [-c-a+b]
1 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
10 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
30 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
50 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
50 MHz	-10 dBm		_____ dBm	_____ dBm	_____ dB
100 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
300 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
500 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB

Input-B

Frequency	3458A Reading [a]	8751A Reading [b]	Test Result [-a+b]
5 Hz	_____ dBm	_____ dBm	_____ dB
10 Hz	_____ dBm	_____ dBm	_____ dB
100 Hz	_____ dBm	_____ dBm	_____ dB
100 kHz	_____ dBm	_____ dBm	_____ dB
200 kHz	_____ dBm	_____ dBm	_____ dB
500 kHz	_____ dBm	_____ dBm	_____ dB

Frequency	Input Level	20 dB Cal. Value [c]	Power Meter Reading [a]	8751A Reading [b]	Test Result [-c-a+b]
1 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
10 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
30 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
50 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
50 MHz	-10 dBm		_____ dBm	_____ dBm	_____ dB
100 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
300 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB
500 MHz	-30 dBm	_____ dBm	_____ dBm	_____ dBm	_____ dB

Magnitude Ratio/Phase Dynamic Accuracy Test

Step Attenuator Calibration Value (at 50 MHz)

Nominal Value		Calibration Value
10 dB	a1 =	_____ dB
20 dB	a2 =	_____ dB
30 dB	a3 =	_____ dB
40 dB	a4 =	_____ dB
50 dB	a5 =	_____ dB
60 dB	a6 =	_____ dB
70 dB	a7 =	_____ dB
80 dB	a8 =	_____ dB

A/R Dynamic Accuracy (Mag. Ratio (50 MHz), Phase (3 MHz)) Test

Step Attenuator Setting	Phase (3 MHz)	Mag. Ratio (50 MHz) [b]		Test Result	HP 8751A Input Level
R-side 20 dB	_____ deg	_____ dB	-a2+b	_____ dB	-20 dBm
10 dB	_____ deg	_____ dB	-a1+b	_____ dB	-30 dBm
A-side 10 dB	_____ deg	_____ dB	a1+b	_____ dB	-50 dBm
20 dB	_____ deg	_____ dB	a2+b	_____ dB	-60 dBm
30 dB	_____ deg	_____ dB	a3+b	_____ dB	-70 dBm
40 dB	_____ deg	_____ dB	a4+b	_____ dB	-80 dBm
50 dB	_____ deg	_____ dB	a5+b	_____ dB	-90 dBm
60 dB	_____ deg	_____ dB	a6+b	_____ dB	-100 dBm
70 dB	_____ deg	_____ dB	a7+b	_____ dB	-110 dBm
80 dB	_____ deg	_____ dB	a8+b	_____ dB	-120 dBm

B/R Dynamic Accuracy (Mag. Ratio (50 MHz), Phase (3 MHz)) Test

Step Attenuator Setting	Phase (3 MHz)	Mag. Ratio (50 MHz) [b]		Test Result	HP 8751A Input Level
R-side 20 dB	_____ deg	_____ dB	-a2+b	_____ dB	-20 dBm
10 dB	_____ deg	_____ dB	-a1+b	_____ dB	-30 dBm
B-side 10 dB	_____ deg	_____ dB	a1+b	_____ dB	-50 dBm
20 dB	_____ deg	_____ dB	a2+b	_____ dB	-60 dBm
30 dB	_____ deg	_____ dB	a3+b	_____ dB	-70 dBm
40 dB	_____ deg	_____ dB	a4+b	_____ dB	-80 dBm
50 dB	_____ deg	_____ dB	a5+b	_____ dB	-90 dBm
60 dB	_____ deg	_____ dB	a6+b	_____ dB	-100 dBm
70 dB	_____ deg	_____ dB	a7+b	_____ dB	-110 dBm
80 dB	_____ deg	_____ dB	a8+b	_____ dB	-120 dBm

A/B Dynamic Accuracy (Mag. Ratio (50 MHz), Phase (3 MHz)) Test

Step Attenuator Setting	Phase (3 MHz)	Mag. Ratio (50 MHz) [b]		Test Result	HP 8751A Input Level
B-side 20 dB	_____ deg	_____ dB	-a2+b	_____ dB	-20 dBm
10 dB	_____ deg	_____ dB	-a1+b	_____ dB	-30 dBm
A-side 10 dB	_____ deg	_____ dB	a1+b	_____ dB	-50 dBm
20 dB	_____ deg	_____ dB	a2+b	_____ dB	-60 dBm
30 dB	_____ deg	_____ dB	a3+b	_____ dB	-70 dBm
40 dB	_____ deg	_____ dB	a4+b	_____ dB	-80 dBm
50 dB	_____ deg	_____ dB	a5+b	_____ dB	-90 dBm
60 dB	_____ deg	_____ dB	a6+b	_____ dB	-100 dBm
70 dB	_____ deg	_____ dB	a7+b	_____ dB	-110 dBm
80 dB	_____ deg	_____ dB	a8+b	_____ dB	-120 dBm

A/R Dynamic Accuracy at the other frequencies Test

HP 8751A Frequency		Reading Value ATT = 10 dB [a]	Reading Value ATT = 0 dB [b]	Test Result ATT = 0 dB [-a+b]
1 kHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
1 kHz	Phase:	_____ deg	_____ deg	_____ deg
1 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
1 MHz	Phase:	_____ deg	_____ deg	_____ deg
50 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
50 MHz	Phase:	_____ deg	_____ deg	_____ deg
100 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
100 MHz	Phase:	_____ deg	_____ deg	_____ deg
200 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
200 MHz	Phase:	_____ deg	_____ deg	_____ deg
300 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
300 MHz	Phase:	_____ deg	_____ deg	_____ deg
400 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
400 MHz	Phase:	_____ deg	_____ deg	_____ deg
500 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
500 MHz	Phase:	_____ deg	_____ deg	_____ deg

B/R Dynamic Accuracy at the other frequencies Test

HP 8751A Frequency		Reading Value ATT = 10 dB [a]	Reading Value ATT = 0 dB [b]	Test Result ATT = 0 dB [-a+b]
1 kHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
1 kHz	Phase:	_____ deg	_____ deg	_____ deg
1 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
1 MHz	Phase:	_____ deg	_____ deg	_____ deg
50 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
50 MHz	Phase:	_____ deg	_____ deg	_____ deg
100 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
100 MHz	Phase:	_____ deg	_____ deg	_____ deg
200 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
200 MHz	Phase:	_____ deg	_____ deg	_____ deg
300 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
300 MHz	Phase:	_____ deg	_____ deg	_____ deg
400 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
400 MHz	Phase:	_____ deg	_____ deg	_____ deg
500 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
500 MHz	Phase:	_____ deg	_____ deg	_____ deg

A/B Dynamic Accuracy at the other frequencies Test

HP 8751A Frequency		Reading Value ATT = 10 dB [a]	Reading Value ATT = 0 dB [b]	Test Result ATT = 0 dB [-a+b]
1 kHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
1 kHz	Phase:	_____ deg	_____ deg	_____ deg
1 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
1 MHz	Phase:	_____ deg	_____ deg	_____ deg
50 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
50 MHz	Phase:	_____ deg	_____ deg	_____ deg
100 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
100 MHz	Phase:	_____ deg	_____ deg	_____ deg
200 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
200 MHz	Phase:	_____ deg	_____ deg	_____ deg
300 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
300 MHz	Phase:	_____ deg	_____ deg	_____ deg
400 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
400 MHz	Phase:	_____ deg	_____ deg	_____ deg
500 MHz	Mag.Ratio:	_____ dB	_____ dB	_____ dB
500 MHz	Phase:	_____ deg	_____ deg	_____ deg

PERFORMANCE TEST RECORD

Hewlett-Packard 8751A NETWORK ANALYZER

Date: _____
Temperature: _____
Humidity: _____
Serial No.: _____
Tested by: _____

Frequency Range and Accuracy Test

without OPTION 001

Frequency	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
5 Hz	4.99890 Hz	_____	±5.00110 Hz	0.000177 Hz
6.387499999 MHz	6.3873722 MHz	_____	6.3876277 MHz	±1.33 Hz
17.387499999 MHz	17.387152 MHz	_____	17.387847 MHz	±3.6 Hz
83.069 MHz	83.067338 MHz	_____	83.070661 MHz	±17.2 Hz
250 MHz	249.99499 MHz	_____	250.00500 MHz	±52 Hz
500 MHz	499.98999 MHz	_____	500.01000 MHz	±97 Hz

with OPTION 001

Frequency	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
5 Hz	4.99900 Hz	_____	5.00101 Hz	±0.000177 Hz
6.387499999 MHz	6.3874936 MHz	_____	6.3875064 MHz	±1.33 Hz
17.387499999 MHz	17.387483 MHz	_____	17.387517 MHz	±3.6 Hz
83.069 MHz	83.068916 MHz	_____	83.069083 MHz	±17.2 Hz
250 MHz	249.99974 MHz	_____	250.00025 MHz	±52 Hz
500 MHz	499.99949 MHz	_____	500.00050 MHz	±97 Hz

Harmonics Test

Frequency	Harmonics Frequency	Test Result	Test Limit	Measurement Uncertainty
100 Hz	200 Hz	_____	< -30 dBc	±1.97 dB
	300 Hz	_____	< -30 dBc	±1.97 dB
10 kHz	20 kHz	_____	< -30 dBc	±1.97 dB
	30 kHz	_____	< -30 dBc	±1.97 dB
500 kHz	1 MHz	_____	< -30 dBc	±1.97 dB
	1.5 MHz	_____	< -30 dBc	±1.97 dB
10 MHz	20 MHz	_____	< -30 dBc	±1.97 dB
	30 MHz	_____	< -30 dBc	±1.97 dB
100 MHz	200 MHz	_____	< -30 dBc	±1.97 dB
	300 MHz	_____	< -30 dBc	±1.97 dB
300 MHz	600 MHz	_____	< -30 dBc	±1.97 dB
	900 MHz	_____	< -30 dBc	±1.97 dB
500 MHz	1 GHz	_____	< -30 dBc	±1.97 dB
	1.5 GHz	_____	< -30 dBc	±1.97 dB

Non-Harmonic Sprious Test

Frequency	Test Result	Test Limit	Measurement Uncertainty
493.7625 MHz	_____	< -45 dBc	± 2.05 dB
493.76274125 MHz	_____	< -45 dBc	±2.05 dB
493.7649125 MHz	_____	< -45 dBc	±2.05 dB
493.786625 MHz	_____	< -45 dBc	±2.05 dB
426 MHz	_____	< -45 dBc	±2.05 dB

Phase Noise Test

Reference	Frequency	Test Result	Test Limit	Measurement Uncertainty
4 MHz	3.98 MHz	_____	< -75 dBc/Hz	±2.46 dB
	4.02 MHz	_____	< -75 dBc/Hz	±2.46 dB
249 MHz	248.98 MHz	_____	< -75 dBc/Hz	±2.46 dB
	249.02 MHz	_____	< -75 dBc/Hz	±2.46 dB
498.5875 MHz	498.5675 MHz	_____	< -75 dBc/Hz	±2.46 dB
	498.6075 MHz	_____	< -75 dBc/Hz	±2.46 dB

Source Level Linearity/Flatness Test

Level Accuracy (at 50 MHz, 0 dBm)

Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
-0.5 dBm	_____	+0.5 dBm	±0.08 dB

Level Flatness (Relative to 0 dBm at 50 MHz)

Frequency	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
5 Hz	-2.0 dB	_____	+2.0 dB	±0.04 dB
50 Hz	-2.0 dB	_____	+2.0 dB	±0.04 dB
1 kHz	-2.0 dB	_____	+2.0 dB	±0.04 dB
10 kHz	-2.0 dB	_____	+2.0 dB	±0.04 dB
100 kHz	-2.0 dB	_____	+2.0 dB	±0.04 dB
1 MHz	-2.0 dB	_____	+2.0 dB	±0.09 dB
10 MHz	-1.5 dB	_____	+1.5 dB	±0.09 dB
100 MHz	-1.5 dB	_____	+1.5 dB	±0.10 dB
300 MHz	-1.5 dB	_____	+1.5 dB	±0.10 dB
500 MHz	-2.0 dB	_____	+2.0 dB	±0.10 dB

Non Sweep Power Linearity Test

Output Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
+15 dBm	-0.5 dB	_____	+0.5 dB	0.03 dB
+10 dBm	-0.5 dB	_____	+0.5 dB	0.03 dB
-10 dBm	-0.5 dB	_____	+0.5 dB	0.03 dB
-15 dBm	-0.5 dB	_____	+0.5 dB	0.09 dB
-20 dBm	-0.5 dB	_____	+0.5 dB	0.09 dB
-25 dBm	-0.5 dB	_____	+0.5 dB	0.03 dB
-30 dBm	-0.5 dB	_____	+0.5 dB	0.03 dB
-35 dBm	-0.5 dB	_____	+0.5 dB	0.03 dB
-40 dBm	-1.5 dB	_____	+1.5 dB	0.03 dB
-50 dBm	-1.5 dB	_____	+1.5 dB	0.12 dB

Power Sweep Linearity Test

CW FREQUENCY = 500 kHz

STOP Power	Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
-15 dBm	-20 dBm	-0.35 dB	_____	+0.35 dB	±0.086 dB
	-25 dBm	-0.50 dB	_____	+0.50 dB	±0.086 dB
	-30 dBm	-0.65 dB	_____	+0.65 dB	±0.086 dB
	-35 dBm	-0.80 dB	_____	+0.80 dB	±0.086 dB
	-40 dBm	-1.75 dB	_____	+1.75 dB	±0.086 dB
	-45 dBm	-1.90 dB	_____	+1.90 dB	±0.086 dB
	-50 dBm	-3.05 dB	_____	+3.05 dB	±0.086 dB
-20 dBm	-25 dBm	-0.35 dB	_____	+0.35 dB	±0.086 dB
	-30 dBm	-0.50 dB	_____	+0.50 dB	±0.086 dB
	-35 dBm	-0.65 dB	_____	+0.65 dB	±0.086 dB
	-40 dBm	-0.80 dB	_____	+0.80 dB	±0.086 dB
	-45 dBm	-1.75 dB	_____	+1.75 dB	±0.086 dB
	-50 dBm	-2.90 dB	_____	+2.90 dB	±0.086 dB
-25 dBm	-30 dBm	-0.35 dB	_____	+0.35 dB	±0.086 dB
	-35 dBm	-0.50 dB	_____	+0.50 dB	±0.086 dB
	-40 dBm	-0.65 dB	_____	+0.65 dB	±0.086 dB
	-45 dBm	-0.80 dB	_____	+0.80 dB	±0.086 dB
	-50 dBm	-1.95 dB	_____	+1.95 dB	±0.086 dB
-30 dBm	-35 dBm	-0.35 dB	_____	+0.35 dB	±0.086 dB
	-40 dBm	-0.50 dB	_____	+0.50 dB	±0.086 dB
	-45 dBm	-0.65 dB	_____	+0.65 dB	±0.086 dB
	-50 dBm	-1.80 dB	_____	+1.80 dB	±0.086 dB
-35 dBm	-40 dBm	-0.35 dB	_____	+0.35 dB	±0.086 dB
	-45 dBm	-0.50 dB	_____	+0.50 dB	±0.086 dB
	-50 dBm	-1.65 dB	_____	+1.65 dB	±0.086 dB
-40 dBm	-45 dBm	-0.35 dB	_____	+0.35 dB	±0.086 dB
	-50 dBm	-1.50 dB	_____	+1.50 dB	±0.086 dB
-45 dBm	-50 dBm	-1.35 dB	_____	+1.35 dB	±0.086 dB

CW FREQUENCY = 1 MHz

STOP Power Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
-15 dBm -20 dBm	-0.35 dB	_____	+0.35 dB	±0.086 dB
-25 dBm	-0.50 dB	_____	+0.50 dB	±0.086 dB
-30 dBm	-0.65 dB	_____	+0.65 dB	±0.086 dB
-35 dBm	-0.80 dB	_____	+0.80 dB	±0.086 dB
-40 dBm	-1.75 dB	_____	+1.75 dB	±0.086 dB
-45 dBm	-1.90 dB	_____	+1.90 dB	±0.086 dB
-50 dBm	-3.05 dB	_____	+3.05 dB	±0.086 dB
-20 dBm -25 dBm	-0.35 dB	_____	+0.35 dB	±0.086 dB
-30 dBm	-0.50 dB	_____	+0.50 dB	±0.086 dB
-35 dBm	-0.65 dB	_____	+0.65 dB	±0.086 dB
-40 dBm	-0.80 dB	_____	+0.80 dB	±0.086 dB
-45 dBm	-1.75 dB	_____	+1.75 dB	±0.086 dB
-50 dBm	-2.90 dB	_____	+2.90 dB	±0.086 dB
-25 dBm -30 dBm	-0.35 dB	_____	+0.35 dB	±0.086 dB
-35 dBm	-0.50 dB	_____	+0.50 dB	±0.086 dB
-40 dBm	-0.65 dB	_____	+0.65 dB	±0.086 dB
-45 dBm	-0.80 dB	_____	+0.80 dB	±0.086 dB
-50 dBm	-1.95 dB	_____	+1.95 dB	±0.086 dB
-30 dBm -35 dBm	-0.35 dB	_____	+0.35 dB	±0.086 dB
-40 dBm	-0.50 dB	_____	+0.50 dB	±0.086 dB
-45 dBm	-0.65 dB	_____	+0.65 dB	±0.086 dB
-50 dBm	-1.80 dB	_____	+1.80 dB	±0.086 dB
-35 dBm -40 dBm	-0.35 dB	_____	+0.35 dB	±0.086 dB
-45 dBm	-0.50 dB	_____	+0.50 dB	±0.086 dB
-50 dBm	-1.65 dB	_____	+1.65 dB	±0.086 dB
-40 dBm -45 dBm	-0.35 dB	_____	+0.35 dB	±0.086 dB
-50 dBm	-1.50 dB	_____	+1.50 dB	±0.086 dB
-45 dBm -50 dBm	-1.35 dB	_____	+1.35 dB	±0.086 dB

CW FREQUENCY = 10 MHz

STOP Power	Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
-15 dBm	-20 dBm	-0.35 dB	_____	+0.35 dB	±0.090 dB
	-25 dBm	-0.50 dB	_____	+0.50 dB	±0.090 dB
	-30 dBm	-0.65 dB	_____	+0.65 dB	±0.090 dB
	-35 dBm	-0.80 dB	_____	+0.80 dB	±0.090 dB
	-40 dBm	-1.75 dB	_____	+1.75 dB	±0.090 dB
	-45 dBm	-1.90 dB	_____	+1.90 dB	±0.100 dB
	-50 dBm	-3.05 dB	_____	+3.05 dB	±0.151 dB
-20 dBm	-25 dBm	-0.35 dB	_____	+0.35 dB	±0.090 dB
	-30 dBm	-0.50 dB	_____	+0.50 dB	±0.090 dB
	-35 dBm	-0.65 dB	_____	+0.65 dB	±0.090 dB
	-40 dBm	-0.80 dB	_____	+0.80 dB	±0.090 dB
	-45 dBm	-1.75 dB	_____	+1.75 dB	±0.100 dB
	-50 dBm	-2.90 dB	_____	+2.90 dB	±0.151 dB
-25 dBm	-30 dBm	-0.35 dB	_____	+0.35 dB	±0.026 dB
	-35 dBm	-0.50 dB	_____	+0.50 dB	±0.026 dB
	-40 dBm	-0.65 dB	_____	+0.65 dB	±0.028 dB
	-45 dBm	-0.80 dB	_____	+0.80 dB	±0.052 dB
	-50 dBm	-1.95 dB	_____	+1.95 dB	±0.125 dB
-30 dBm	-35 dBm	-0.35 dB	_____	+0.35 dB	±0.026 dB
	-40 dBm	-0.50 dB	_____	+0.50 dB	±0.028 dB
	-45 dBm	-0.65 dB	_____	+0.65 dB	±0.053 dB
	-50 dBm	-1.80 dB	_____	+1.80 dB	±0.125 dB
-35 dBm	-40 dBm	-0.35 dB	_____	+0.35 dB	±0.029 dB
	-45 dBm	-0.50 dB	_____	+0.50 dB	±0.053 dB
	-50 dBm	-1.65 dB	_____	+1.65 dB	±0.126 dB
-40 dBm	-45 dBm	-0.35 dB	_____	+0.35 dB	±0.054 dB
	-50 dBm	-1.50 dB	_____	+1.50 dB	±0.126 dB
-45 dBm	-50 dBm	-1.35 dB	_____	+1.35 dB	±0.133 dB

CW FREQUENCY = 100 MHz

STOP Power	Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
-15 dBm	-20 dBm	-0.35 dB	_____	+0.35 dB	±0.090 dB
	-25 dBm	-0.50 dB	_____	+0.50 dB	±0.090 dB
	-30 dBm	-0.65 dB	_____	+0.65 dB	±0.090 dB
	-35 dBm	-0.80 dB	_____	+0.80 dB	±0.090 dB
	-40 dBm	-1.75 dB	_____	+1.75 dB	±0.090 dB
	-45 dBm	-1.90 dB	_____	+1.90 dB	±0.100 dB
	-50 dBm	-3.05 dB	_____	+3.05 dB	±0.151 dB
-20 dBm	-25 dBm	-0.35 dB	_____	+0.35 dB	±0.090 dB
	-30 dBm	-0.50 dB	_____	+0.50 dB	±0.090 dB
	-35 dBm	-0.65 dB	_____	+0.65 dB	±0.090 dB
	-40 dBm	-0.80 dB	_____	+0.80 dB	±0.090 dB
	-45 dBm	-1.75 dB	_____	+1.75 dB	±0.100 dB
	-50 dBm	-2.90 dB	_____	+2.90 dB	±0.151 dB
-25 dBm	-30 dBm	-0.35 dB	_____	+0.35 dB	±0.026 dB
	-35 dBm	-0.50 dB	_____	+0.50 dB	±0.026 dB
	-40 dBm	-0.65 dB	_____	+0.65 dB	±0.028 dB
	-45 dBm	-0.80 dB	_____	+0.80 dB	±0.052 dB
	-50 dBm	-1.95 dB	_____	+1.95 dB	±0.125 dB
-30 dBm	-35 dBm	-0.35 dB	_____	+0.35 dB	±0.026 dB
	-40 dBm	-0.50 dB	_____	+0.50 dB	±0.028 dB
	-45 dBm	-0.65 dB	_____	+0.65 dB	±0.053 dB
	-50 dBm	-1.80 dB	_____	+1.80 dB	±0.125 dB
-35 dBm	-40 dBm	-0.35 dB	_____	+0.35 dB	±0.029 dB
	-45 dBm	-0.50 dB	_____	+0.50 dB	±0.053 dB
	-50 dBm	-1.65 dB	_____	+1.65 dB	±0.126 dB
-40 dBm	-45 dBm	-0.35 dB	_____	+0.35 dB	±0.054 dB
	-50 dBm	-1.50 dB	_____	+1.50 dB	±0.126 dB
-45 dBm	-50 dBm	-1.35 dB	_____	+1.35 dB	±0.133 dB

CW FREQUENCY = 300 MHz

STOP Power	Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
-15 dBm	-20 dBm	-0.70 dB	_____	+0.70 dB	±0.050 dB
	-25 dBm	-1.20 dB	_____	+1.20 dB	±0.050 dB
	-30 dBm	-1.70 dB	_____	+1.70 dB	±0.050 dB
	-35 dBm	-2.20 dB	_____	+2.20 dB	±0.050 dB
	-40 dBm	-3.50 dB	_____	+3.5 dB	±0.052 dB
	-45 dBm	-4.00 dB	_____	+4.00 dB	±0.068 dB
	-50 dBm	-5.50 dB	_____	+5.50 dB	±0.132 dB
-20 dBm	-25 dBm	-0.70 dB	_____	+0.70 dB	±0.050 dB
	-30 dBm	-1.20 dB	_____	+1.20 dB	±0.050 dB
	-35 dBm	-1.70 dB	_____	+1.70 dB	±0.050 dB
	-40 dBm	-2.20 dB	_____	+2.20 dB	±0.052 dB
	-45 dBm	-3.50 dB	_____	+3.50 dB	±0.068 dB
	-50 dBm	-5.00 dB	_____	+5.00 dB	±0.132 dB
-25 dBm	-30 dBm	-0.70 dB	_____	+0.70 dB	±0.026 dB
	-35 dBm	-1.20 dB	_____	+1.20 dB	±0.026 dB
	-40 dBm	-1.70 dB	_____	+1.70 dB	±0.028 dB
	-45 dBm	-2.20 dB	_____	+2.20 dB	±0.052 dB
	-50 dBm	-3.70 dB	_____	+3.70 dB	±0.125 dB
-30 dBm	-35 dBm	-0.70 dB	_____	+0.70 dB	±0.026 dB
	-40 dBm	-1.20 dB	_____	+1.20 dB	±0.028 dB
	-45 dBm	-1.70 dB	_____	+1.70 dB	±0.053 dB
	-50 dBm	-3.20 dB	_____	+3.20 dB	±0.125 dB
-35 dBm	-40 dBm	-0.70 dB	_____	+0.70 dB	±0.029 dB
	-45 dBm	-1.20 dB	_____	+1.20 dB	±0.053 dB
	-50 dBm	-2.70 dB	_____	+2.70 dB	±0.126 dB
-40 dBm	-45 dBm	-0.70 dB	_____	+0.70 dB	±0.054 dB
	-50 dBm	-2.20 dB	_____	+2.20 dB	±0.126 dB
-45 dBm	-50 dBm	-1.70 dB	_____	+1.70 dB	±0.133 dB

CW FREQUENCY = 500 MHz

STOP Power	Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
-15 dBm	-20 dBm	-0.70 dB	_____	+0.70 dB	±0.050 dB
	-25 dBm	-1.20 dB	_____	+1.20 dB	±0.050 dB
	-30 dBm	-1.70 dB	_____	+1.70 dB	±0.050 dB
	-35 dBm	-2.20 dB	_____	+2.20 dB	±0.050 dB
	-40 dBm	-3.50 dB	_____	+3.5 dB	±0.052 dB
	-45 dBm	-4.00 dB	_____	+4.00 dB	±0.068 dB
	-50 dBm	-5.50 dB	_____	+5.50 dB	±0.132 dB
-20 dBm	-25 dBm	-0.70 dB	_____	+0.70 dB	±0.050 dB
	-30 dBm	-1.20 dB	_____	+1.20 dB	±0.050 dB
	-35 dBm	-1.70 dB	_____	+1.70 dB	±0.050 dB
	-40 dBm	-2.20 dB	_____	+2.20 dB	±0.052 dB
	-45 dBm	-3.50 dB	_____	+3.50 dB	±0.068 dB
	-50 dBm	-5.00 dB	_____	+5.00 dB	±0.132 dB
-25 dBm	-30 dBm	-0.70 dB	_____	+0.70 dB	±0.026 dB
	-35 dBm	-1.20 dB	_____	+1.20 dB	±0.026 dB
	-40 dBm	-1.70 dB	_____	+1.70 dB	±0.028 dB
	-45 dBm	-2.20 dB	_____	+2.20 dB	±0.052 dB
	-50 dBm	-3.70 dB	_____	+3.70 dB	±0.125 dB
-30 dBm	-35 dBm	-0.70 dB	_____	+0.70 dB	±0.026 dB
	-40 dBm	-1.20 dB	_____	+1.20 dB	±0.028 dB
	-45 dBm	-1.70 dB	_____	+1.70 dB	±0.053 dB
	-50 dBm	-3.20 dB	_____	+3.20 dB	±0.125 dB
-35 dBm	-40 dBm	-0.70 dB	_____	+0.70 dB	±0.029 dB
	-45 dBm	-1.20 dB	_____	+1.20 dB	±0.053 dB
	-50 dBm	-2.70 dB	_____	+2.70 dB	±0.126 dB
-40 dBm	-45 dBm	-0.70 dB	_____	+0.70 dB	±0.054 dB
	-50 dBm	-2.20 dB	_____	+2.20 dB	±0.126 dB
-45 dBm	-50 dBm	-1.70 dB	_____	+1.70 dB	±0.133 dB

Receiver Noise Level Test

IF BW = 2 Hz

Frequency	R	A	B	Test Limit
5 Hz	_____	_____	_____	< -95 dB
205 Hz	_____	_____	_____	< -95 dB

IF BW = 20 Hz

Frequency	R	A	B	Test Limit
205 Hz	_____	_____	_____	< -95 dB
1 kHz	_____	_____	_____	< -95 dB
10 kHz	_____	_____	_____	< -95 dB
25 kHz	_____	_____	_____	< -100 dB
60 kHz	_____	_____	_____	< -105 dB
100 kHz	_____	_____	_____	< -110 dB
1.1 MHz	_____	_____	_____	< -110 dB
10 MHz	_____	_____	_____	< -110 dB
101 MHz	_____	_____	_____	< -110 dB
401 MHz	_____	_____	_____	< -110 dB
499 MHz	_____	_____	_____	< -110 dB

IF BW = 200 Hz

Frequency	R	A	B	Test Limit
2 kHz	_____	_____	_____	< -85 dB
10 kHz	_____	_____	_____	< -85 dB
25 kHz	_____	_____	_____	< -90 dB
60 kHz	_____	_____	_____	< -95 dB
100 kHz	_____	_____	_____	< -100 dB
1.1 MHz	_____	_____	_____	< -100 dB
10 MHz	_____	_____	_____	< -100 dB
101 MHz	_____	_____	_____	< -100 dB
401 MHz	_____	_____	_____	< -100 dB
499 MHz	_____	_____	_____	< -100 dB

IF BW = 1 kHz

Frequency	R	A	B	Test Limit
100 kHz	_____	_____	_____	< -90 dB
1.1 MHz	_____	_____	_____	< -90 dB
10 MHz	_____	_____	_____	< -90 dB
101 MHz	_____	_____	_____	< -90 dB
401 MHz	_____	_____	_____	< -90 dB
499 MHz	_____	_____	_____	< -90 dB

IF BW = 4 kHz

Frequency	R	A	B	Test Limit
100 kHz	_____	_____	_____	< -85 dB
1.1 MHz	_____	_____	_____	< -85 dB
10 MHz	_____	_____	_____	< -85 dB
101 MHz	_____	_____	_____	< -85 dB
401 MHz	_____	_____	_____	< -85 dB
499 MHz	_____	_____	_____	< -85 dB

Trace Noise Test

Measurement	Frequency		Test Result	Test Limit
A/R	100 kHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
	1 MHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
	10 MHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
	100 MHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
	500 MHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
B/R	100 kHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
	1 MHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
	10 MHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
	100 MHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
	500 MHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
A/B	100 kHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
	1 MHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
	10 MHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
	100 MHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°
	500 MHz	Magnitude	_____	< 0.01 dB
		Phase	_____	< 0.05°

Residual Response Test

Input-R

Frequency	Test Result	Test Limit
6.25 MHz	_____	< -100 dBm
40.77575 MHz	_____	< -100 dBm
43.004342105 MHz	_____	< -100 dBm
45.480555556 MHz	_____	< -100 dBm
48.248088235 MHz	_____	< -100 dBm
51.3615625 MHz	_____	< -100 dBm
54.890166667 MHz	_____	< -100 dBm
58.922857143 MHz	_____	< -100 dBm
139.968541667 MHz	_____	< -100 dBm
152.835454545 MHz	_____	< -100 dBm
281.4175 MHz	_____	< -100 dBm
300 MHz	_____	< -100 dBm
325 MHz	_____	< -100 dBm
337.96225 MHz	_____	< -100 dBm
362.270357143 MHz	_____	< -100 dBm
375.687777778 MHz	_____	< -100 dBm

Input-A

Frequency	Test Result	Test Limit
6.25 MHz	_____	< -100 dBm
40.77575 MHz	_____	< -100 dBm
43.004342105 MHz	_____	< -100 dBm
45.480555556 MHz	_____	< -100 dBm
48.248088235 MHz	_____	< -100 dBm
51.3615625 MHz	_____	< -100 dBm
54.890166667 MHz	_____	< -100 dBm
58.922857143 MHz	_____	< -100 dBm
139.968541667 MHz	_____	< -100 dBm
152.835454545 MHz	_____	< -100 dBm
281.4175 MHz	_____	< -100 dBm
300 MHz	_____	< -100 dBm
325 MHz	_____	< -100 dBm
337.96225 MHz	_____	< -100 dBm
362.270357143 MHz	_____	< -100 dBm
375.687777778 MHz	_____	< -100 dBm

Input-B

Frequency	Test Result	Test Limit
6.25 MHz	_____	< -100 dBm
40.77575 MHz	_____	< -100 dBm
43.004342105 MHz	_____	< -100 dBm
45.480555556 MHz	_____	< -100 dBm
48.248088235 MHz	_____	< -100 dBm
51.3615625 MHz	_____	< -100 dBm
54.890166667 MHz	_____	< -100 dBm
58.922857143 MHz	_____	< -100 dBm
139.968541667 MHz	_____	< -100 dBm
152.835454545 MHz	_____	< -100 dBm
281.4175 MHz	_____	< -100 dBm
300 MHz	_____	< -100 dBm
325 MHz	_____	< -100 dBm
337.96225 MHz	_____	< -100 dBm
362.270357143 MHz	_____	< -100 dBm
375.687777778 MHz	_____	< -100 dBm

Input Crosstalk Test

Measurement	Frequency	Test Result	Test Limit
R into A Crosstalk	5 Hz to 10 kHz	_____	< -95 dB
R into B Crosstalk	5 Hz to 10 kHz	_____	< -95 dB
R into A Crosstalk	10 kHz to 500 MHz	_____	< -100 dB
R into B Crosstalk	10 kHz to 500 MHz	_____	< -100 dB
A into R Crosstalk	5 Hz to 10 kHz	_____	< -95 dB
A into B Crosstalk	5 Hz to 10 kHz	_____	< -95 dB
A into R Crosstalk	10 kHz to 500 MHz	_____	< -100 dB
A into B Crosstalk	10 kHz to 500 MHz	_____	< -100 dB
B into R Crosstalk	5 Hz to 10 kHz	_____	< -95 dB
B into A Crosstalk	5 Hz to 10 kHz	_____	< -95 dB
B into R Crosstalk	10 kHz to 500 MHz	_____	< -100 dB
B into A Crosstalk	10 kHz to 500 MHz	_____	< -100 dB

Input Impedance Test

Measurement	ATT	Frequency	Test Result	Test Limit	Measurement Uncertainty
B Return Loss	20 dB	5 Hz to 100 MHz	_____	> 25 dB	±1.7 dB
	20 dB	100 MHz to 300 MHz	_____	> 25 dB	±1.7 dB
	20 dB	300 MHz to 500 MHz	_____	> 20 dB	±1.0 dB
	0 dB	5 Hz to 100 MHz	_____	> 20 dB	±1.0 dB
	0 dB	100 MHz to 300 MHz	_____	> 15 dB	±0.7 dB
	0 dB	300 MHz to 500 MHz	_____	> 10 dB	±0.5 dB
A Return Loss	20 dB	5 Hz to 100 MHz	_____	> 25 dB	±1.7 dB
	20 dB	100 MHz to 300 MHz	_____	> 25 dB	±1.7 dB
	20 dB	300 MHz to 500 MHz	_____	> 20 dB	±1.0 dB
	0 dB	5 Hz to 100 MHz	_____	> 20 dB	±1.0 dB
	0 dB	100 MHz to 300 MHz	_____	> 15 dB	±0.7 dB
	0 dB	300 MHz to 500 MHz	_____	> 10 dB	±0.5 dB
R Return Loss	20 dB	5 Hz to 100 MHz	_____	> 25 dB	±1.7 dB
	20 dB	100 MHz to 300 MHz	_____	> 25 dB	±1.7 dB
	20 dB	300 MHz to 500 MHz	_____	> 20 dB	±1.0 dB
	0 dB	5 Hz to 100 MHz	_____	> 20 dB	±1.0 dB
	0 dB	100 MHz to 300 MHz	_____	> 15 dB	±0.7 dB
	0 dB	300 MHz to 500 MHz	_____	> 10 dB	±0.5 dB

Absolute Amplitude Accuracy Test

Input-R

ATT	Frequency	Mimimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
0 dB	5 Hz	-1.0 dB	_____	+1.0 dB	±0.15 dB
0 dB	10 Hz	-1.0 dB	_____	+1.0 dB	±0.15 dB
0 dB	100 Hz	-1.0 dB	_____	+1.0 dB	±0.15 dB
0 dB	100 kHz	-1.0 dB	_____	+1.0 dB	±0.15 dB
0 dB	200 kHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	500 kHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	1 MHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	10 MHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	30 MHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	50 MHz	-1.0 dB	_____	+1.0 dB	±0.16 dB
20 dB	50 MHz	-1.0 dB	_____	+1.0 dB	±0.17 dB
0 dB	100 MHz	-1.0 dB	_____	+1.0 dB	±0.19 dB
0 dB	300 MHz	-1.0 dB	_____	+1.0 dB	±0.19 dB
0 dB	500 MHz	-1.5 dB	_____	+1.5 dB	±0.19 dB

Input-A

ATT	Frequency	Mimimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
0 dB	5 Hz	-1.0 dB	_____	+1.0 dB	±0.15 dB
0 dB	10 Hz	-1.0 dB	_____	+1.0 dB	±0.15 dB
0 dB	100 Hz	-1.0 dB	_____	+1.0 dB	±0.15 dB
0 dB	100 kHz	-1.0 dB	_____	+1.0 dB	±0.15 dB
0 dB	200 kHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	500 kHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	1 MHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	10 MHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	30 MHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	50 MHz	-1.0 dB	_____	+1.0 dB	±0.16 dB
20 dB	50 MHz	-1.0 dB	_____	+1.0 dB	±0.17 dB
0 dB	100 MHz	-1.0 dB	_____	+1.0 dB	±0.19 dB
0 dB	300 MHz	-1.0 dB	_____	+1.0 dB	±0.19 dB
0 dB	500 MHz	-1.5 dB	_____	+1.5 dB	±0.19 dB

Input-B

ATT	Frequency	Mimimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
0 dB	5 Hz	-1.0 dB	_____	+1.0 dB	±0.15 dB
0 dB	10 Hz	-1.0 dB	_____	+1.0 dB	±0.15 dB
0 dB	100 Hz	-1.0 dB	_____	+1.0 dB	±0.15 dB
0 dB	100 kHz	-1.0 dB	_____	+1.0 dB	±0.15 dB
0 dB	200 kHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	500 kHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	1 MHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	10 MHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	30 MHz	-1.0 dB	_____	+1.0 dB	±0.18 dB
0 dB	50 MHz	-1.0 dB	_____	+1.0 dB	±0.16 dB
20 dB	50 MHz	-1.0 dB	_____	+1.0 dB	±0.17 dB
0 dB	100 MHz	-1.0 dB	_____	+1.0 dB	±0.19 dB
0 dB	300 MHz	-1.0 dB	_____	+1.0 dB	±0.19 dB
0 dB	500 MHz	-1.5 dB	_____	+1.5 dB	±0.19 dB

Magnitude Ratio/Phase Dynamic Accuracy Test

A/R Dynamic Accuracy (Magnitude Ratio (50 MHz) and Phase (3 MHz)) Test

Magnitude Ratio (50 MHz).

A Input Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
-20 dBm	-0.1 dB	_____	+0.1 dB	±0.010 dB
-30 dBm	-0.05 dB	_____	+0.05 dB	±0.010 dB
-50 dBm	-0.05 dB	_____	+0.05 dB	±0.010 dB
-60 dBm	-0.05 dB	_____	+0.05 dB	±0.010 dB
-70 dBm	-0.05 dB	_____	+0.05 dB	±0.010 dB
-80 dBm	-0.05 dB	_____	+0.05 dB	±0.012 dB
-90 dBm	-0.1 dB	_____	+0.1 dB	±0.018 dB
-100 dBm	-0.3 dB	_____	+0.3 dB	±0.021 dB
-110 dBm	-0.9 dB	_____	+0.9 dB	±0.028 dB
-120 dBm	-3.0 dB	_____	+3.0 dB	±0.052 dB

Phase (3 MHz).

A Input Level	Minimum Limit	Test Result	Maximum Limit
-20 dBm	-1.2 °	_____	+1.2 °
-30 dBm	-0.3 °	_____	+0.3 °
-50 dBm	-0.3 °	_____	+0.3 °
-60 dBm	-0.3 °	_____	+0.3 °
-70 dBm	-0.3 °	_____	+0.3 °
-80 dBm	-0.3 °	_____	+0.3 °
-90 dBm	-0.6 °	_____	+0.6 °
-100 dBm	-1.8 °	_____	+1.8 °
-110 dBm	-6.0 °	_____	+6.0 °
-120 dBm	-18.0 °	_____	+18.0 °

B/R Dynamic Accuracy (Magnitude Ratio (50 MHz) and Phase (3 MHz)) Test

Magnitude Ratio (50 MHz).

B Input Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
-20 dBm	-0.1 dB	_____	+0.1 dB	±0.010 dB
-30 dBm	-0.05 dB	_____	+0.05 dB	±0.010 dB
-50 dBm	-0.05 dB	_____	+0.05 dB	±0.010 dB
-60 dBm	-0.05 dB	_____	+0.05 dB	±0.010 dB
-70 dBm	-0.05 dB	_____	+0.05 dB	±0.010 dB
-80 dBm	-0.05 dB	_____	+0.05 dB	±0.012 dB
-90 dBm	-0.1 dB	_____	+0.1 dB	±0.018 dB
-100 dBm	-0.3 dB	_____	+0.3 dB	±0.021 dB
-110 dBm	-0.9 dB	_____	+0.9 dB	±0.028 dB
-120 dBm	-3.0 dB	_____	+3.0 dB	±0.052 dB

Phase (3 MHz).

B Input Level	Minimum Limit	Test Result	Maximum Limit
-20 dBm	-1.2 °	_____	+1.2 °
-30 dBm	-0.3 °	_____	+0.3 °
-50 dBm	-0.3 °	_____	+0.3 °
-60 dBm	-0.3 °	_____	+0.3 °
-70 dBm	-0.3 °	_____	+0.3 °
-80 dBm	-0.3 °	_____	+0.3 °
-90 dBm	-0.6 °	_____	+0.6 °
-100 dBm	-1.8 °	_____	+1.8 °
-110 dBm	-6.0 °	_____	+6.0 °
-120 dBm	-18.0 °	_____	+18.0 °

A/B Dynamic Accuracy (Magnitude Ratio (50 MHz) and Phase (3 MHz)) Test

Magnitude Ratio (50 MHz).

A Input Level	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
-20 dBm	-0.1 dB	_____	+0.1 dB	±0.010 dB
-30 dBm	-0.05 dB	_____	+0.05 dB	±0.010 dB
-50 dBm	-0.05 dB	_____	+0.05 dB	±0.010 dB
-60 dBm	-0.05 dB	_____	+0.05 dB	±0.010 dB
-70 dBm	-0.05 dB	_____	+0.05 dB	±0.010 dB
-80 dBm	-0.05 dB	_____	+0.05 dB	±0.012 dB
-90 dBm	-0.1 dB	_____	+0.1 dB	±0.018 dB
-100 dBm	-0.3 dB	_____	+0.3 dB	±0.021 dB
-110 dBm	-0.9 dB	_____	+0.9 dB	±0.028 dB
-120 dBm	-3.0 dB	_____	+3.0 dB	±0.052 dB

Phase (3 MHz).

A Input Level	Minimum Limit	Test Result	Maximum Limit
-20 dBm	-1.2 °	_____	+1.2 °
-30 dBm	-0.3 °	_____	+0.3 °
-50 dBm	-0.3 °	_____	+0.3 °
-60 dBm	-0.3 °	_____	+0.3 °
-70 dBm	-0.3 °	_____	+0.3 °
-80 dBm	-0.3 °	_____	+0.3 °
-90 dBm	-0.6 °	_____	+0.6 °
-100 dBm	-1.8 °	_____	+1.8 °
-110 dBm	-6.0 °	_____	+6.0 °
-120 dBm	-18.0 °	_____	+18.0 °

A/R Dynamic Accuracy at the Other Frequencies Test

Frequency	Measurement	Minimum Limit	Test Result	Maximum Limit
1 kHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
1 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
50 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
100 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
200 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
300 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
400 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
500 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°

B/R Dynamic Accuracy at the Other Frequencies Test

Frequency	Measurement	Minimum Limit	Test Result	Maximum Limit
1 kHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
1 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
50 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
100 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
200 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
300 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
400 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
500 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°

A/B Dynamic Accuracy at the Other Frequencies Test

Frequency	Measurement	Minimum Limit	Test Result	Maximum Limit
1 kHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
1 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
50 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
100 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
200 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
300 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
400 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°
500 MHz	Magnitude Ratio	-0.1 dB	_____	+0.1 dB
	Phase	-1.2°	_____	+1.2°

Magnitude Ratio Frequency Response Test

Measurement	Frequency	Mimimum Limit	Test Result	Maximum Limit
A/R	5 Hz to 100 MHz	-0.5 dB	_____	+0.5 dB
	100 MHz to 300 MHz	-1.0 dB	_____	+1.0 dB
	300 MHz to 500 MHz	-1.5 dB	_____	+1.5 dB
B/R	5 Hz to 100 MHz	-0.5 dB	_____	+0.5 dB
	100 MHz to 300 MHz	-1.0 dB	_____	+1.0 dB
	300 MHz to 500 MHz	-1.5 dB	_____	+1.5 dB
A/B	5 Hz to 100 MHz	-0.5 dB	_____	+0.5 dB
	100 MHz to 300 MHz	-1.0 dB	_____	+1.0 dB
	300 MHz to 500 MHz	-1.5 dB	_____	+1.5 dB

Phase Freqnecy Response Test

Measurement	Frequency	Mimimum Limit	Test Result	Maximum Limit
A/R	5 Hz to 100 MHz	-2.5°	_____	+2.5°
	100 MHz to 300 MHz	-5.0°	_____	+5.0°
	300 MHz to 500 MHz	-10.0°	_____	+10.0°
B/R	5 Hz to 100 MHz	-2.5°	_____	+2.5°
	100 MHz to 300 MHz	-5.0°	_____	+5.0°
	300 MHz to 500 MHz	-10.0°	_____	+10.0°
A/B	5 Hz to 100 MHz	-2.5°	_____	+2.5°
	100 MHz to 300 MHz	-5.0°	_____	+5.0°
	300 MHz to 500 MHz	-10.0°	_____	+10.0°

DC Measurement Range and Accuracy Test

Input Voltage	Minimum Limit	Test Result	Maximum Limit	Measurement Uncertainty
0 V	-0.005 V	_____	+0.005 V	±0.00032 V
2 V	1.985 V	_____	+2.015 V	±0.00004 V
-2 V	-1.985 V	_____	-2.015 V	±0.00032 V

A

Manual Changes

INTRODUCTION

This appendix usually contains information required to adapt this manual to earlier versions or configurations of the HP 8751A than the current printing date of this manual. The information is this manual directly to HP 8751A Network Analyzer whose serial number prefix is listed on the title page of this manual.

MANUAL CHANGES

To adapt this manual to your HP 8751A, refer to Table A-1, and make all of the manual changes listed opposite your instrument's serial number.

Instruments manufactured after the printing of this manual may be different than whose documented in this manual. Later instrument versions will be documented in a manual change supplement that will accompany the manual shipped with that instrument. If your manual or in Table A-1, it may be documented in a yellow *MANUAL CHANGES* supplements.

For additional information on serial number coverage, refer to "INSTRUMENTS COVERED BY MANUAL" in Chapter 1.

Table A-1. Manual Changes by Serial Number

Serial Prefix or Number	Make Manual Changes
	There are no earlier configurations than the printing date of this manual.

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Reorder No. or
Manual Part No.
08751-90030

Manufacturing
Part No.
08751-90030

08751-90030